The 10th Emerging Information and Technology Conference
(EITC-2010)

Research, Innovation and Commercialization

Conference Proceedings

James H. Clark Center, Stanford University
Stanford, CA, U.S.A.

Saturday - Sunday, August 14th - 15th, 2010

Table of Contents

Welcome Message

Distinguished colleagues: **(NEED REPLACING)**

It is with pleasure that we welcome all of you to join us in the 9th Emerging Information and Technology Conference (EITC-2009). This conference will be held at MIT with four parallel technical tracks that highlight the advancement of emerging technologies.

The main mission of EITC is to strengthen the technical and business ties between Asian and North American universities, R&D institutions, and industries. This conference was initiated by visionary leaders who recognized that globalization is a driving force for accelerated intellectual and economic development. Interactions among Asian Pacific and North American professionals are a catalyst for technology innovations. Since the inception of EITC, many outstanding academic and industrial leaders around the world contributed to the success of this conference and inspired many young scholars and professionals.

Owing to the tireless efforts of the organizing committee and the generosity of our sponsors, EITC-2009 is shaping up to be a successful event. We look forward to your participation, and hope you enjoy the historic and cultural attractions in Boston during your visit.

Sincerely yours,

Sow-Hsin Chen	General Conference Chair	Massachusetts Institute of Technology
Lin-Wen Hu	Conference Co-Chair	Massachusetts Institute of Technology
Chin Pan	Conference Co-Chair	National Tsing Hua University

Conference Themes

"Research, Innovation and Commercialization"

- **Research** - to conduct pioneering research in key areas of emerging technologies and services,

- **Innovation** - to make fundamental discoveries, generate innovative solutions to practical problems,

- **Commercialization** - to develop new technologies for commercial application.

The EITC-2010 consists of following four workshops:

- **Workshop 1 (W1)**: New Energy, Environment, Sustainability

- **Workshop 2 (W2)**: Bioinformatics, Biotechnology, Medicine, Public Health

- **Workshop 3 (W3)**: Advanced Materials Science, Nanotechnology, MEMS

- **Workshop 4 (W4)**: C4I (Content, Computer, Communication, Consumer Electronics, and Integration), SoC (System-on-a-Chip)

Planning Committee

General Conference Chair

Ching H. Wang		Stanford University
Si-Chen Lee	李嗣涔	National Taiwan University

Conference Chairs

Josephine M. Cheng	鄭妙勤	IBM Research - Almaden
Lin-Shan Lee	李琳山	National Taiwan University

Conference Organizers

Lin-Wen Hu	胡玲文	Massachusetts Institute of Technology
Sao-Jie Chen	陳少傑	National Taiwan University
Ko-Yang Wang	王可言	IBM Global Business Services
Howard Chen	陳浩	IBM T. J. Waston Research Center
Zekai Hsiau	蕭子凱	KCodes Corporation
Larry Wang	王南雷	TriQuint Semiconductor
Karis Yilun Lee	李依倫	Stanford University
Hank Hsieh		Stanford University
Wilson Wei-Cheng Lee	李偉誠	Stanford University
Yu-Hung Li	黎昱宏	Stanford University
Hsin-Hsiung Chang	張新雄	Science & Technology Division, TECRO in the U.S.
Jerry K. H. Chen	陳寬享	Investment & Trade Office, TECRO in the U.S.
Pauline Chen	陳寶鈴	Cultural Division, TECO in San Francisco

Program Committee

Program Steering Committee

Teresa H. Meng	孟懷縈	Stanford University
Minking Chyu	邱民京	University of Pittsburgh
Mau-Chung Frank Chang	張懋中	University of California at Los Angeles
Fu-Kuo Chang	張福國	Stanford University

Program Committee Chairs

Ko-Yang Wang	王可言	IBM Global Business Services
Liang-Gee Chen	陳良基	National Taiwan University

Workshop Track/Session Chairs

Workshop 1: New Energy, Environment and Sustainability

Che-Wun Hong	洪哲文	National Tsing Hua University
Wei-Jen Lee	李偉仁	University of Texas at Arlington
Grace Lin	林蔚君	Columbia University
Peter Mei	梅家駒	21-Century Silicon, Inc.
Kan-Lin Hsueh	薛康琳	National United University
Ko-Yang Wang	王可言	IBM Global Business Service

Workshop 2: Medicine, and Public Health, Biotechnology,Bioinformatics

Li-San Wang	王立三	University of Pennsylvania
Yi-Hsiang (Sean) Hsu	許益祥	Harvard University
Wen-Yih Issac Tseng	曾文毅	National Taiwan University
Jung-Ying Tzeng	曾仲瑩	North Carolina State University

Workshop 3: Nanotechnology, NEMS and MEMS

Chih-Hung (Alex) Chang	張至弘	Oregon State University
Darrin J. Young	楊駿	University of Utah
Lei Kerr	柯蕾	Miami University
Hsuan-Liang (Kevin) Liu	劉宣良	National Taipei University of Technology
Kuo-Lun Allan Tung	童國倫	Chung-Yuan University
Kuan-Jiuh Lin	林寬鋸	National Chung-Hsing University
Ching-Fuh Lin	林清富	National Taiwan University
Hsien-Hung Wei	魏憲鴻	National Cheng-Kung University

Workshop 4: SoC (System-on-a-Chip), C4I (Content, Computer, Communications, Consumer Electronics, and Integration)

Howard Chen	陳浩	IBM T.J. Watson Research Center
Liang-Gee Chen	陳良基	National Taiwan University
Scott Chun-Yang Chen	陳俊仰	Facebook Inc.
Sao-Jie Chen	陳少傑	National Taiwan University
Kea-Tiong Samuel Tang	鄭桂忠	National Tsing Hua University
Yung-Hsiang Lu	陸永祥	Purdue University
Jiun-In Guo	郭峻因	National Chung-Cheng University
Wei Hwang	黃威	National Chiao-Tung University
Chen-Yi Lee	李鎮宜	National Chiao-Tung University

Conference Manager

Wilson Wei-Cheng Lee	李偉誠	Stanford University

Publication

Conference Program	Howard Chen	陳浩	IBM T. J. Watson Research Center
Conference Proceedings	Hsi-Pin Ma	馬席彬	National Tsing Hua University

Conference Treasurer

Chinese Institute of Engineers

Local Management (Student Volunteers)

Yu-Hung Li	黎昱宏	Stanford University
Jaclyn Chen	陳奕如	Stanford University

General Inquiries

Tel: 212-752-2340
E-mail: eitc.usa@hotmail.com

On-Site Registration

Stanford Taiwanese Student Association 史丹佛大學台灣同學會

Web Development

Wei-Cheng Wong	翁唯城	University of Texas at Dallas
Michael Hwa-Han Wang	王華漢	EBMedia LLC

Co-organizing Associations

Organizing Associations

Stanford Taiwanese Student Association

Stanford Alumni Association, Taiwan

Co-organizing Associations

Chinese Institute of Engineers - GNYC

Science & Technology Division, Taipei Economic & Cultural Representative Office in the U.S.

Investment & Trade Office, Taipei Economic & Cultural Representative Office in the U.S.

Cultural Division, Taipei Economic & Cultural Office in San Francisco

Sponsors

Conference Program

Day 1 (Saturday, August 14th, 2010)

8/14th (Sat) 8:00 am - 6:00 pm : Registration
Room:

8/14th (Sat) 8:30 am - 9:15 am : Opening Session
Chair: Professor Lin-Shan Lee, National Taiwan University (台灣大學電機資訊學院院長 李琳山 教授)
Room: Auditorium

Mr. Thomas J. C. Chen (tecosf@sbcglobal.net)
Director General, Taipei Economic and Cultural Office in San Francisco
駐舊金山台北經濟文化辦事處 陳經銓 處長

Professor Ching H. Wang (wangch@stanford.edu)
Pediatric neurology, Stanford Hospital and Clinics and Lucile Packard Children's Hospital

Ms. Josephine M. Cheng (chengjm@us.ibm.com)
IBM Fellow and Vice President, IBM Almaden Research Center
國際商業機器公司副總裁 鄭妙勤 女士

Professor Lin-Shan Lee (lslee@cc.ee.ntu.edu.tw)
Dean, College of Electrical Engineering and Computer Science, National Taiwan University
台灣大學電機資訊學院院長 李琳山 教授

8/14th (Sat) 9:15 am - 10:35 am : Technical Session D1-W1-T1: New Energy, Environment and Sustainability
Chair: Professor Che-Wun Hong, National Tsing-Hua University (清華大學動力機械工程學系 洪哲文 教授)
Room: S363

"Green data center"
Dr. Hui-I Hsiao (hhsiao@almaden.ibm.com)
Program Director, Technology Innovation for Emerging Market, IBM Almaden Research Center
國際商業機器公司研究中心 蕭暉議 博士

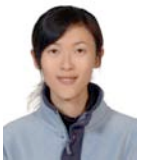
"Utility and smart grid"
Mr. Rick Geiger (rggeiger@cisco.com)
Director, Business Development for Enterprise Utility Solutions, Cisco Systems
思科系統公司 蓋格 先生

"Enabling technologies for customer demand and budget management in the deregulated environment"
Professor Wei-Jen Lee (**wlee@uta.edu**)
Director, Energy Systems Research Center, the University of Texas at Arlington
德州大學阿靈頓分校能源系統研究中心主任 李偉仁 教授

8/14th (Sat) 9:15 am - 10:35 am : Technical Session D1-W2-T1: Computational Genomics and System Biology
Chair: Professor Li-San Wang, University of Pennsylvania (賓州大學醫學院 王立三 教授)
Room: S362

"Marker-set association analysis for gene and gene-environment effects via gene-trait similarity regression"
Professor Jung-Ying Tzeng (**jytzeng@stat.ncsu.edu**)
Department of Statistics and Bioinformatics Research Center, North Carolina State University
北卡洛來那州立大學統計系 曾仲瑩 教授

Professor Shengan Lee (shengan@mail.knu.edu.tw)
Department of Computer Science and Information Engineering, Kainan University
開南大學資訊工程學系 李盛安 教授



"Enhancing sensitivity&specificity of predicting transcription factor association by discovery from ChIP-chip data"
Mei-Ju May Chen (meijuchen@ntu.edu.tw)
Genome and Systems Biology Degree Program, co-organized by National Taiwan University and Academia Sinica
台灣大學與中央研究院合辦之基因體與系統生物學學位學程博士班研究生 陳玫如

8/14th (Sat) 9:15 am - 10:35 am : Technical Session D1-W3-T1: NEMS and MEMS (1)
Chair: Professor Darrin J. Young, University of Utah (猶他州立大學 楊駿 教授)
Room: S361

"Nanogenerator for electric clothing"
Professor Liwei Lin (lwlin@me.berkeley.edu)
Co-Director, Berkeley Sensor and Actuator Center, University of California, Berkeley
加州大學柏克來分校機械工程系 林立偉 教授

"Nanowire electromechanical devices and systems – from fundamentals to emerging technologies"
Dr. Xiaoli Philip Feng (xfeng@caltech.edu)
Condensed Matter Physics, California Institute of Technology

"Low power sensing electronics for high-resolution error-correcting biomechanical ground reaction sensor"
Professor Darrin J. Young (darrin.young@utah.edu)
Department of Electrical and Computer Engineering, University of Utah
猶他州立大學電機工程與計算機科學系 楊駿 教授

8/14th (Sat) 9:15 am - 10:35 am : Technical Session D1-W4-T1: SoC/C4I (1)
Chair: Professor Sao-Jie Chen, National Taiwan University (台灣大學電機工程學系 陳少傑 教授)
Room: S360

"System-on-chip: Will scaling challenges curtail growth?"
Dr. Howard Ko (howardko@synopsys.com)
Senior Vice President and General Manager, Silicon Engineering Group, Synopsys, Inc.
新思科技有限公司資深副總裁 柯復華 博士

"Digital system verification using massively parallel processor arrays"
Dr. Mike Bershteyn (bmike@cadence.com)
Chief Hardware Fellow, Cadence Design Systems
益華電腦科技公司 柏旭天 博士

"The challenge of system-level design"
Dr. Andreas Kuehlmann (kuehl@cadence.com)
Cadence Fellow, Director of Cadence Research Laboratories
益華電腦科技公司研究實驗室主任 柯曼 博士

8/14th (Sat) 10:35 am - 11:00 am : Break

Parallel Sessions:
8/14th (Sat) 11:00 am – 12:20 pm : Technical Session D1-W1-T2: New Energy, Environment and Sustainability
Chair: Professor Wei-Jen Lee, the University of Texas at Arlington (德州大學阿靈頓分校 李偉仁 教授)
Room: S363

"Electrochemical energy conversion and storage – fuel cells and redox battery"
Professor Kan-Lin Hsueh (KanLinHsueh@nuu.edu.tw)
Director of Energy Research Center, National United University
聯合大學能源研究中心 薛康琳 主任

"Direct conversion of green energy: From quantum to system"
Professor Che-Wun Hong (cwhong@pme.nthu.edu.tw)
Department of Power Mechanical Engineering, National Tsing-Hua University
清華大學動力機械工程學系 洪哲文 教授

"Smart grid – Demand-side perspectives"
Dr. Edwin Liu (eliu@quanta-technology.com)
Vice President of Strategy Initiatives and Executive Advisor, Quanta Technology

8/14th (Sat) 11:00 am – 12:20 pm : Technical Session D1-W2-T2: Medicine
Chair: Professor Wen-Yih Isaac Tseng, National Taiwan University(台灣大學醫學院 曾文毅 教授**)**
Room: S362

"Epigenetic control of heart development and disease"
Professor Ching-Pin Chang (**chingpin@stanford.edu**)
Division of Cardiovascular Medicine, Department of Medicine, Stanford University
史丹佛大學醫學系 張景濱 教授

"Imaging technology for personalized medicine"
Professor Wen-Yih Isaac Tseng (**wytseng@ntu.edu.tw**)
Center for Optoelectronic Biomedicine, National Taiwan University Hospital
台灣大學醫學院光電生物醫學中心 曾文毅 教授

"Electrical stimulation of degenerate retina towards the development of prosthetic vision for the blind"
Leanne Lai-Hang Chan (lechan@chla.usc.edu)
Post-doctorate Associate, Neuroscience Program, Saban Research Institute, Childrens Hospital Los Angeles
洛杉磯兒童醫院 陳儷行 博士

8/14th (Sat) 11:00 am – 12:20 pm : Technical Session D1-W3-T2: Nanotechnology
Chair: Professor Chih-Hung (Alex) Chang, Oregon State University (奥勒岡州立大學化學工程系 張至弘 教授)
Room: S361

"Nanoporous membranes formed by interferometric lithography"
Dr. Joseph W. Tringe (**tringe2@llnl.gov**)
Staff Scientist, Lawrence Livermore National Laboratory
勞倫斯立佛摩國家實驗室 特林其 博士

"Opportunities and challenges in developing flexible organic electronics"
Professor Samuel Graham (sgraham@gatech.edu)
The George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology
喬治亞理工學院機械工程系 葛蘭姆 教授

8/14th (Sat) 11:00 am – 12:20 pm : Technical Session D1-W4-T2: Medical System-on-Chip
Chair: Professor Kea-Tiong Samuel Tang, National Tsing Hua University (清華大學電機工程系 鄭桂忠 教授)
Room: S360

"Low-power analog front-end circuits for healthcare system and telemetry devices"
Professor Shuenn-Yuh Lee (ieesyl@ccu.edu.tw)
System-on-Chip (SoC) Research Center, National Chung Cheng University
中正大學電機工程學系 李順裕 教授

"Towards an electronic nose system-on-chip"
Professor Kea-Tiong Samuel Tang (kttang@ee.nthu.edu.tw)
Department of Electrical Engineering, National Tsing Hua University,
清華大學電機工程系 鄭桂忠 教授

"Low-power analog front-end circuits for ECG acquisition systems"
Professor Tsung-Heng Tsai (ttsai@ee.ccu.edu.tw)
Department of Electrical Engineering, National Chung Cheng University
中正大學電機工程學系 蔡宗亨 教授

8/14 (Sat) 12:20 pm - 2:00 pm : Lunch
Room:

Parallel Workshop Keynote Sessions:
8/14th (Sat) 2:00 pm - 2:55 pm: Workshop 1 & 3 Keynote (New Energy/Nanotechnology/ NEMS)
Chair: Professor Che-Wun Hong, National Tsing-Hua University (清華大學動力機械工程學系 洪哲文 教授)
Room: S361

Professor Friedrich B. Prinz (fbp@cdr.stanford.edu)
Rodney H. Adams Professor and Robert Bosch Chair, School of Engineering, Stanford University

8/14th (Sat) 2:00 pm - 2:55 pm: Workshop 4 Keynote (SoC/C4I):
Chair: Professor Liang-Gee Chen, National Taiwan University (台灣大學電機資訊學院副院長 陳良基 教授)
Room: S360

"Chip design and implementation service in Taiwan"
Dr. Chin-Long Wey (clwey@cic.org.tw)
Vice president, National Chip Implementation Center , National Applied Research Laboratories
國家實驗研究院國家晶片系統設計中心主任 魏慶隆 博士

Parallel Sessions:
8/14th (Sat) 2:55 pm – 4:15 pm : Technical Session D1-W1-T3: New Energy, Environment and Sustainability:
Chair: Professor Grace Lin, Columbia University (哥倫比亞大學工業工程系 林蔚君 教授)
Room: S363

"Smart water management"
Mr. Peter Williams
Distinguished Engineer & Chief Technology Officer, Big Green Innovations, IBM Sales & Distribution
國際商業機器公司技術長 威廉斯 先生

"High pressure soda pop - How can we use it greenly?**"**
Dr. Hsiao-Yuan Bruce Li (**bli@GhGSaviorTech.com**)
President and Chief Technology Officer, GhG SaviorTech Corporation
GhG SaviorTech 總裁 李曉遠 博士

"Trends of green vehicle development"
Professor Yi-Hsuan Hung (**hungyh@ntnu.edu.tw**)
Department of Industrial Education, National Taiwan Normal University
師範大學工業教育學系 洪翊軒 教授

8/14 (Sat) 2:55 pm – 4:15 pm : Technical Session D1-W2-T3: Bioinformatics
Chair: Professor Jung-Ying Tzeng, North Carolina State University (北卡洛來那州立大學統計系 曾仲瑩 教授)
Room: S362

"Correcting population stratification in genetic association studies using a phylogenetic approach"
Professor Li-San Wang (lswang@mail.med.upenn.edu)
Institute on Aging / Penn Center for Bioinformatics, University of Pennsylvania
賓州大學醫學院 王立三 教授

"The past, present and future of genome-wide association study (GWAS)"
Kei-Hang Katie Chan (katiekhchan@ucla.edu)
Department of Epidemiology, University of California, Los Angeles
加州大學洛杉磯分校流行病學系研究生 陳紀行

"Development of an environmentally benign, multifunctional biomedical surface treatment system using an
atmospheric-pressure plasma jet"
Professor Jong-Shinn Wu (chongsin@faculty.nctu.edu.tw), National Chiao Tung University
交通大學機械工程學系 吳宗信 教授

8/14th (Sat) 2:55 pm – 4:15 pm : Technical Session D1-W3-T3: Nanotechnology
Chair: Professor Hsuan-Liang Liu, National Taipei University of Technology (台北科技大學 劉宣良 教授)
Room: S361

Dr. William M. Tong (will.tong@transelcorp.com)
Technology Advisor, Nanofabrication & Nonvolatile Memory, TransEL
TransEL技術顧問 唐文偉 博士

"Mesoporous materials for biomedical and energy applications"
Professor Chia-Wen (Kevin) Wu (**kevinwu@ntu.edu.tw**)
Department of Chemical Engineering, National Taiwan University
台灣大學化學工程系 吳嘉文 教授

"Towards cost-effective encapsulation architectures and barrier layers for organic electronic devices"
Dr. Jimmy Granstrom (jimmy.granstrom@me.gatech.edu)
Post-doctoral fellow, School of Mechanical Engineering, Georgia Institute of Technology
喬治亞理工學院研究員 葛蘭斯重 博士

8/14th (Sat) 2:55 pm – 4:15 pm : Technical Session D1-W4-T3: Wireless System
Chair: Professor Yung-Hsiang Lu, Purdue University (普度大學電機與計算機工程學院 陸永祥

教授)
Room: S360

"Mobile and cloud computing – Opportunities and challenges"
Professor Yung-Hsiang Lu (yunglu@purdue.edu)
School of Electrical and Computer Engineering, Purdue University
普度大學電機與計算機工程學院 陸永祥 教授

"Beyond 3G™, Unlimited capacity"
Dr. James Larsen (james.larsen@iwics.com)
CEO & Chairman, Intelligent Wireless Integrated Communications Systems (IWICS, Inc.)
IWICS 執行長 拉森 博士

"The wireless noiseless handset"
Zye-Kong Cheng (zkc400@gmail.com)
System Solutions Consultant, GhG SaviorTech Corporation
GhG SaviorTech 顧問 鄭志剛 先生

8/14th (Sat) 4:15 pm – 4:40 pm : Break

8/14th (Sat) 4:40 pm – 6:00 pm : Technical Session D1-W1-T4: New Energy, Environment and Sustainability:
Chair: Professor Kan-Lin Hsueh, National United University (聯合大學能源研究中心主任 薛康琳 教授)
Room: S363

"From renewable energy to energy saving: Fluid and thermal aspect"
Professor Shih-Hsiung Chen (shchen86@hotmail.com)
Department of Aeronautics and Astronautics, National Cheng Kung University
成功大學航空太空工程研究所 陳世雄 教授

"American Power Act to world power practice: A giant paradigm shift toward a carbon economy"
Dr. Truman G. Blocker III (tblocker3@GhGSaviorTech.com)
Director, Research and Development, GhG SaviorTech Corporation
GhG SaviorTech 研發長 布拉克 博士

8/14th (Sat) 4:40 pm – 6:00 pm : Technical Session D1-W3-T4: Nanotechnology
Chair: Professor Kuo-Lun Allan Tung, Chung Yuan University (中原大學薄膜研發中心主任 童國倫 教授)
Room: S361

"A novel computational approach to identify the binding modes of various dyes towards different
protofibrils associated with neurodegenerative disorders and virtual screening"
Professor Hsuan-Liang (Kevin) Liu (f10894@ntut.edu.tw), National Taipei University of Technology
台北科技大學生物科技研究所所長 劉宣良 教授

"Nanopore characterization techniques – Status quo and future development"
Professor Kuo-Lun Allan Tung (**kuolun@cycu.edu.tw**)
Director, Research and Development Center for Membrane Technology, Chung Yuan University
中原大學薄膜研發中心主任 童國倫 教授

"Engineering microsystems to guide cell behaviors"
Professor Chia-Chi Ho (**Chiachi.Ho@UC.edu**)
Department of Chemical and Materials Engineering, University of Cincinnati
辛辛那提大學化學與材料工程系 何嘉琪 教授

8/14th (Sat) 4:40 pm – 6:00 pm : Technical Session D1-W4-T4: Multimedia System-On-Chip
Chair: Professor Jiun-In Guo, National Chung Cheng University (中正大學資訊工程系 郭峻因 教授**)**
Room: S360

"Low power video technology for multimedia SoC design"
Professor Jiun-In Guo (**jiguo@cs.ccu.edu.tw**)
Department of Computer Science and Information Engineering, National Chung Cheng University
中正大學資訊工程系 郭峻因 教授

"Debunking the 100x GPU vs. CPU myth: An evaluation of throughput computing on CPU and GPU"
Dr. Yen-Kuang Chen (yen-kuang.chen@intel.com)
Principal Research Scientist, Intel Corporation
英代爾公司研究科學家 陳彥光 博士

"Innovation and commercialization of microdisplay for 3D applications"
Dr. Bor-Yeu Tsaur (btsaur@kopin.com)
Executive Vice President and General Manager, Display Operations, Kopin Corporation
高平磊晶科技 執行副總裁 曹伯禹 博士

8/14th (Sat) 7:00 pm – 9:00 pm : Dinner Keynote Speech (by invitation)

"ECFA: The Economic Cooperation Framework Agreement" (兩岸經濟協議)
Dr. James Hsin-Hua Wu (hhwu@moea.gov.tw)
Director, Commercial Division, Taipei Economic & Cultural Office in Los Angeles
駐洛杉磯台北經濟文化辦事處商務組組長 吳新華 博士

Day 2 (Sunday, August 15, 2010)

8/15 (Sun) 8:00 am - 6:00 pm : Registration
Room:

8/15th (Sun) 9:15 am - 10:35 am : Technical Session D2-W1-T1: New Energy, Environment and Sustainability:
Chair: Peter Mei, 21-Century Silicon, Inc. (21-Century Silicon 執行長 梅家駒)
Room: S363

"Teaching entrepreneurs how to build sustainable businesses"
Dr. Dwight Collins (dwight.collins@presidioedu.org)
Professor, Sustainability Management, Presidio Graduate School
普思蒂歐管理學院 柯林斯 博士

"Green supply chain and intelligent transportation"
Dr. Grace Lin (gracelin.ny@gmail.com)
Department of Industrial Engineering & Operations Research, Columbia University
哥倫比亞大學工業工程系 林蔚君 教授

Dr. Ko-Yang Wang (kyw@us.ibm.com)
IBM Distinguished Engineer and IBM GBS BPM Practice Leader, IBM Global Business Services
國際商業機器公司全球商業服務傑出工程師 王可言 博士

8/15th (Sun) 9:15 am - 10:35 am : Technical Session D2-W3-T1: Nanotechnology
Chair: Professor Lei Kerr, Miami University (俄亥俄州邁阿密大學化學工程系 柯蕾 教授)
Room: S361

"Nano-structures for solar cells"
Professor Ching-Fuh Lin (cflin@cc.ee.ntu.edu.tw)
Graduate Institute of Photonics and Optoelectronics, National Taiwan University
台灣大學電機工程學系 林清富 教授

"Cobalt oxide nanowire arrays: Synthesis and energy applications"
Professor Yiying Wu (wu@chemistry.ohio-state.edu)
Department of Chemistry, Ohio State University
俄亥俄州立大學化學系 吳屹影 教授

"Deposition processes of thin-film CIGS-based solar cells"
Professor Chia-hua Huang (chuang@mail.ndhu.edu.tw)
Department of Electrical Engineering, National Dong Hwa University
東華大學電機工程學系 黃家華 教授

8/15th (Sun) 9:15 am - 10:35 am : Technical Session D2-W4-T1: C4I/System-on-Chip
Chair: Professor Wei Hwang, National Chiao-Tung University (交通大學電子工程系 黃威 教授)
Room: S360

"Memory-centric on-chip data communication platform for energy-efficient heterogeneous systems"
Professor Wei Hwang (hwang@mail.nctu.edu.tw)
Microelectronics and Information Systems Research Center, National Chiao-Tung University
交通大學電子工程系 黃威 教授

"Modularized board-level and system-in-package platforms for complex system integration and prototyping"
Dr. Chun-Ming Huang (cmhuang@cic.org.tw)
National Chip Implementation Center, National Applied Research Laboratories
國家實驗研究院晶片系統設計中心設計服務組長 黃俊銘 博士

"Constructing electronic system level models using Simulink"
Dr. Emerson Ming-Fu Hsiao (emerson@faraday-tech.com)
Director, Field Application and Marketing, Faraday Technology Corporation
智原科技 蕭明富 博士

8/15th (Sun) 10:35 am - 11:00 am : Break

8/15th (Sun) 11:00 am – 12:20 pm : Technical Session D2-W1-T2: New Energy, Environment and Sustainability (6)
Chair: Dr. Ko-Yang Wang, IBM Global Business Services (國際商業機器公司 王可言 博士)
Room: S363

"Green economy: A socially responsible and green enterprise"
Albert Oung (aoung@earthbuddy.hk)
Founder & CEO, Earth Buddy Inc. and Eco-Valley Inc.

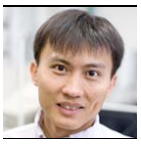
"Venture opportunities in energy, environment, and sustainability"
Dr. Matthew Denesuk (denesuk@us.ibm.com)
Scientist, IBM Research & Partner, IBM Venture Capital
國際商業機器公司風險資本部門科學家 丹思克 博士

"Smart grid"
Dr. Erfan Ibrahim (eibrahim@epri.com)
Smart Grid Communications & Cyber Security Lead, Electric Power Research Institute (EPRI)
電力研究所 亞伯拉漢 博士

8/15th (Sun) 11:00 am – 12:20 pm : Technical Session D2-W3-T2: Nanotechnology
Chair: Professor Kuan-Jiuh Lin, National Chung Hsing Univeristy (中興大學化學系 林寬鋸 教授**)**
Room: S361

"CdS sensitized nanocrystalline solid state and liquid state solar cells"
Professor Lei Kerr (kerrll@muohio.edu)
Department of Paper and Chemical and Engineering, Miami University
俄亥俄州邁阿密大學化學工程系 柯蕾 教授

"Atomic force microscope direct write of Ge nanostructures on Si"
Stephanie Vasko (vasko@u.washington.edu)
Department of Materials Science and Engineering, University of Washington
華盛頓大學材料科學與工程系研究生 法斯柯



Professor Yi Cui (yicui@stanford.edu)
Department of Materials Science and Engineering, Stanford University
史丹佛大學材料科學與工程系 崔屹 教授

8/15th (Sun) 11:00 am – 12:20 pm : Technical Session D2-W4-T2: C4I/Medical System-on-Chip
Chair: Professor Liang-Gee Chen, National Taiwan University (台灣大學電機資訊學院副院長 陳良基 教授)
Room: S360

"Smart CMOS image sensors for biomedical applications"
Professor Jun Ohta (ohta@ms.naist.jp)
Graduate School of Materials Science, Nara Institute of Science and Technology, Japan
奈良先端科學技術大學院 太田淳 教授

"CMOS for biomedical applications"
Professor Luke Theogarajan (ltheogar@ece.ucsb.edu)
Department of Electrical and Computer Engineering, University of California at Santa Barbara
加州大學聖他芭芭拉分校電機與計算機工程學系Theogarajan 教授

"Design and implementation of an XML parsing engine"
Professor Sheng-De Wang (sdwang@ntu.edu.tw)
Department of Electrical Engineering, National Taiwan University
台灣大學電機工程學系 王勝德 教授

8/15th (Sun) 12:20 pm - 2:00 pm : Lunch
Room:

8/15th (Sun) 2:00 pm – 3:20 pm : Technical Session D2-W3-T3: Nanotechology
Chair: **Professor Ching-Fuh Lin, National Taiwan University (**台灣大學電機工程學系 林清富 教授**)**
Room: S361

"Well-aligned multi-walled carbon nanotubes emitting natural white-light under microwave irradiation"
Professor Kuan-Jiuh Lin (kjlin@dragon.nchu.edu.tw)
Department of Chemistry, National Chung-Hsing University
中興大學化學系 林寬鋸 教授

"Electrodeposition of gold, silver on carbon nanotube thin films"
Dr. Si-Ty Lam (sity.lam@hp.com)
Principal Project Scientist, HP Laboratories, Hewlett-Packard Company

8/15th (Sun) 2:00 pm – 3:20 pm : Technical Session D2-W4-T3: Communication System-on-Chip
Chair: Professor Chen-Yi Lee, National Chiao-Tung University (交通大學研發長 李鎮宜 教授)
Room: S360

"Recent progress in communications SoC's"
Professor Chen-Yi Lee (cylee@mail.nctu.edu.tw)
Vice President, Office of Research and Development, National Chiao-Tung University
交通大學研發長 李鎮宜 教授

"Physical design challenge to cognitive radio/software defined radio"
Professor Kazuya Masu (masu.k.aa@m.titech.ac.jp)
Integrated Research Institute & Precision and Intelligence Laboratory, Tokyo Institute of Technology
東京工業大學統合研究院 益一哉 教授

"Recent progress in design methodologies for software defined radio"
Professor Yu-Hen Hu (**hu@engr.wisc.edu**)
Department Electrical and Computer Engineering, University of Wisconsin at Madison
威斯康辛大學電機與計算機工程系 胡玉衡 教授

8/15th (Sun) 3:20 pm – 3:40 pm : Break

8/15th (Sun) 3:40 pm – 5:00 pm : Technical Session D2-W3-T4: Nanotechnology
Chair: Professor Hsien-Hung Wei, National Cheng-Kung University (成功大學化學工程系 魏憲鴻 教授)
Room: S361

"New paradigms for manipulation of DNA molecules at the nanoliter scale"
Professor Hsien-Hung Wei (**hhwei@mail.ncku.edu.tw**)
Department of Chemical Engineering, National Cheng-Kung University
成功大學化學工程系 魏憲鴻 教授

Dr. Bo Zhou (Bo.Zhou@csm-instruments.com)
CSM Instruments SA, Switzerland

"Synthesis and post-processing of nanomaterials using microreaction technology"
Professor Chih-Hung (Alex) Chang (**changch@che.orst.edu**)
Associate Professor, Department of Chemical Engineering, Oregon State University
奧勒岡州立大學化學工程系 張至弘 教授

8/15th (Sun) 4:40 pm – 6:00 pm : Technical Session D2-W4-T4: New Media and Entertainment Technology
Chair: Dr. Scott Chun-Yang Chen, Facebook, Inc. (Facebook 陳俊仰 博士)
Room: S360

"Data infrastructure at Facebook"
Dr. Scott Chun-Yang Chen (cy.scott.chen@gmail.com)
Software engineer, Facebook, Inc.
Facebook 公司 陳俊仰 博士

"Mine your business! – Value and utilization of implicit social networks"
Dr. Ching-Yung Lin (chingyun@us.ibm.com)
Project Lead, Event and Streaming Systems Department, IBM Thomas J. Watson Research Center
國際商業機器公司華生研究中心 林清詠 博士

"Technical challenges and solutions in web-based video conferencing systems"
Dr. Chuo-Ling Chang (chuoling@tokbox.com)
Senior Audio/Video Scientist, TokBox, Inc.
TokBox
資深影音科學家 張倬領 博士

Opening Speech

Conference Chair

Lin-Shan Lee, PhD (李琳山 院長**)**

Dean, College of Electrical Engineering and Computer Science, National Taiwan University
No. 1, Sec. 4, Roosevelt Rd., Taipei, 106, Taiwan, R.O.C.
Tel: +886-2-3366-3547
Email: lslee@cc.ee.ntu.edu.tw

BIOGRAPHY

Lin-shan Lee received a B.S. in Electrical Engineering from National Taiwan University in 1974, an M.S. and a Ph.D. in Electrical Engineering from Stanford University in 1975 and 1977, respectively. He has been a professor of Electrical Engineering and Computer Science of National Taiwan University (since 1982), was a department head of the university (1982-1987), now serves as the dean of College of Electrical Engineering and Computer Science of the university (since 2009), and served as the chair of the Commission on Research and Development of the university (2002-2005). He holds a joint appointment with the Institute of Information Science of Academia Sinica as a research fellow, and was the director of the institute from 1991 to 1997. His research interests include various topics in digital communications such as digital transmission theory and signal processing for communications, as well as spoken language processing including speech recognition and transcription, text-to-speech synthesis, spoken dialogue, and spoken document understanding and retrieval.

He served on various positions of IEEE Communications Society, including regional chair for Asia Pacific (1994-1995), member of the Board of Governors (1994-1997), Vice President for International Affairs (1996-1997) and the Awards Committee chair (1998-1999). He was the Technical Program Chair of IEEE Global Telecommunications Conference (Globecom) 2002 at Taipei. He developed quite several earliest versions of Chinese spoken language processing systems in the world, including text-to-speech systems (since 1984), a natural language analyzer (1986), dictation systems (since 1991), spoken document retrieval systems (since 1997), and spoken dialogue systems (since 1998). He served as a Board member of International Speech Communication Association (ISCA) (2001-2009). He also served as the Distinguished Lecturer of IEEE Signal Processing Society (2007-2008), an associate editor of IEEE Signal Processing Magazine (2003-2006), a member of the Overview Paper Editorial Board of IEEE Signal Processing Society

(since 2009), and the general chair of International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2009 at Taipei.

He was elected IEEE Fellow in 1992 with citation, "For Contributions to Computer Voice Input/Output Techniques for Mandarin Chinese and Engineering Education". He is the recipient of the National Chair Professorship of Taiwan, ROC in 2004 and 2007.

Opening Speech

Guest Speaker

Thomas J. C. Chen (陳經銓 處長)

Dean, College of Nuclear Science
Professor, Department of Engineering and system Science
Director, Energy and environmental Research Center
National Tsing Hua University
Hsinchu, Taiwan, Republic of China
Email: cpan@ess.nthu.edu.tw

BIOGRAPHY

....

Opening Speech

Guest Speaker

Ching H. Wang, PhD (王 博士)

Minister, National Science Council, Executive Yuan, Taiwan, Republic of China
No. 106, HoPing E. Road, Sec.2, Taipei 10622, Taiwan (R.O.C.)
Tel: +886-2-27377992, Fax: +886-2-27377566
Email: chr@nsc.gov.tw

BIOGRAPHY

....

Opening Speech

Ms. Josephine M. Cheng (鄭妙勤 女士)

IBM Fellow and Vice President
IBM Research - Almaden
Email: chengjm@us.ibm.com

BIOGRAPHY

Josephine M. Cheng is an IBM Fellow and Vice President of IBM Research - Almaden in San Jose, California. She oversees more than 400 scientists and engineers doing exploratory and applied research in various hardware, software and service areas, including: nanotechnology, materials science, storage systems, data management, web technologies, workplace practices and user interfaces.

Prior to her current role, Cheng was Vice President of IBM China Development Laboratories from 2004 to 2008. She led the China Software Development Laboratory (CSDL) located in three major cities: Beijing, Shanghai and Taipei, with a combined total of more than 3,000 employees.

Cheng has been at the forefront of relational database technology for over twenty-five years. She was also principally responsible for developing IBM's database technology for the web, allowing people to access huge amounts of data via the internet that was previously accessible only through proprietary systems. Her teams have produced such database technologies and products as: DB2 World-Wide Web and its follow-on, Net.Data, providing web access to corporate databases; XML Extender for DB2, permitting popular XML-formatted data to be integrated into DB2; and DB2 Everyplace, a tiny, totally self-managing database system that extends the power of DB2 to convenient pervasive computing devices such as handheld computers and cellular phones.

Cheng received the Asian American Engineer of the Year award in 2003. She was inducted into the United States National Academy of Engineering (NAE) in 2006 for sustained leadership and contributions to relational database technology and its pervasive applications to a wide range of digital operational systems. Also in 2006, she was named one of the Top 10 Software Leaders in China and received the prestigious Professional Achievement Award from UCLA in 2007. Currently, she is a guest professor at Tsinghua University and Shanghai University; member of the advisory board committee to the School of Software and Microelectronics, Peking University and chaired the advisory board committee of the Department of Computing of Hong Kong Polytechnic University from 2008-2010. Cheng is also on the Electrical

Engineering and Computer Science (EECS) advisory board of the University of California at Berkeley (UCB), as well as a member of San Jose State University's Engineering Industry Advisory Council. Cheng also serves on the advisory board of the UCB Center for Information Technology Research in the Interest of Society (CITRIS), board member of the Bay Area Science and Innovation Consortium (BASIC), University of Miami Department of Electrical and Computer Engineering (ECE) Industrial Advisory Board member, Silicon Valley CTO Forum Advisory Board member and member of the Anita Borg Institute For Women and Technology Board.

Josephine Cheng has been awarded 28 patents for her inventions.

Cheng was educated at the University of California, Los Angeles (B.S., 1975, Mathematics and Computer Science; M.S., 1977, Computer Science). She is a resident of San Jose, California.

Session D1-W1-T1: New Energy, Environment and Sustainability

Session Organizer & Chair

Che-Wun Hong, Ph. D (洪哲文 教授)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

BIOGRAPHY

Prof. Che-Wun Hong was born in Kaohsiung city, Taiwan on March 15th, 1956. He received bachelor degree in Mechanical Engineering from National Cheng-Kung University in 1978. After graduation from the university, he served in the army as an armored vehicle officer (1978~1980), then worked as a mechanical engineer in the Ford Motor Company (1980~1981), and then transferred to the Industrial Technology Research Institute (ITRI) as an engine researcher (1981~1982). In the fall of 1982, after saving enough money, he went to United Kingdom to study higher degrees. He received his MSc degree from the UMIST (Manchester, UK) in 1983 and a PhD degree from the Imperial College (London, UK) in 1987, all majored in Mechanical Engineering.

In 8/1987, he returned to Taiwan and joined the Department of Power Mechanical Engineering of National Tsing Hua University as an associate professor. He was promoted to full professor in 1997. Being a faculty member for 23 years, his research area ranges from internal combustion engines, turbochargers to the automotive engineering; and then he switched to the green power engineering at the millennium. His current research focuses on the fuel cells, solar cells, lithium-ion batteries, ultra-capacitors and thermoelectric chips by means of the academic fundamentals, such as: quantum mechanics, molecular dynamics, Boltzmann modeling, computational fluid dynamics and control system dynamics. He has published more than 200 technical papers, including archived journals, proceedings of national and international conferences and technical reports; also he has registered for two patents in Taiwan and USA.

Session : ***D1-W1-T1: New Energy, Environment and Sustainability***

Green Data Center

Hui-I Hsiao, PhD (蕭暉議 博士)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT:

...

BIOGRAPHY

...

Session : ***D1-W1-T1: New Energy, Environment and Sustainability***

Utility and Smart Grid

Mr. Rick Geiger (蓋格 先生**)**

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT:

...

BIOGRAPHY

...

*Session : **D1-W1-T1: New Energy, Environment and Sustainability***

Enabling Technologies for Customer Demand and Budget Management in the Deregulated Environment

Wei-Jen Lee, PhD (李偉仁 教授)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT:

...

BIOGRAPHY

...

Session : ***D1-W2-T1: Computational Genomics and System Biology***

Session Organizer & Chair

Li-San Wang, PhD (王立三 教授**)**

Assistant Professor of Pathology and Laboratory Medicine
Institute on Aging / Penn Center for Bioinformatics
University of Pennsylvania
Philadelphia, Pennsylvania 19104
Email: lswang@mail.med.upenn.edu

BIOGRAPHY

Li-San Wang received his B.S. (1994) and M.S. (1996) in Electrical Engineering from the National Taiwan University. He received his M.S. (2000) and Ph.D. (2003) from the University of Texas at Austin, both in Computer Sciences, and was a postdoctoral fellow at the University of Pennsylvania between 2003 and 2006. Currently he is an Assistant Professor of Pathology and Laboratory Medicine and a fellow of the Institute on Aging, University of Pennsylvania. Dr. Wang's research interests include phylogenetics, comparative genomics, and microarray analysis. He has authored twenty six peer-reviewed book chapters and journals on computational biology and bioinformatics, and served on the program and organizing committees of several international workshops and conferences.

*Session : **D1-W2-T1: Computational Genomics and System Biology***

Market-set Association Analysis for Gene and Gene-environment Effects via Gene-trait Similarity Regression

Jung-Ying Tzeng, PhD (曾仲瑩 教授)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT:

...

BIOGRAPHY

...

Session : ***D1-W2-T1: Computational Genomics and System Biology***

...

Shengan Lee, PhD (李盛安 教授**)**

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT:

...

BIOGRAPHY

...

Session : D1-W2-T1: Computational Genomics and System Biology

Enhancing Sensitivity and Specificity of Predicting Transcription Factor Association by Motif Discovery from ChIP-chip Data

Mei-Ju May Chen (陳梅如)

Research assistant, department of Bio-Industrial Mechatronics Engineering, National Taiwan University
No.1, Sec. 4, Roosevelt Rd., Da'an Dist., Taipei 106, Taiwan
Tel: +886-2-3366-5373, Fax: +886-2-3366-5373
Email: meijuchen@ntu.edu.tw

ABSTRACT

Gene regulation involves complicated mechanisms such as cooperativity between a set of transcription factors (TFs). Correct prediction of TF association helps to uncover the mystery of gene expression and would greatly facilitate the progress of developing effective therapies for diseases. In the past, the phenomenon that two TFs share many of their target genes is commonly used as a clue to infer TF association. However, it is not an easy job to derive a reliable target gene list for a TF. One way to determine TF-target gene relationships is utilizing known motifs. One could collect the target genes of a TF by matching known TFBSs on the promoter regions of genes. This strategy is limited because, for most genomes, few TFBSs have been experimentally determined so far. This study aims at enhancing sensitivity and specificity of predicting TF association in yeast by motif discovery from ChIP-chip data. The proposed method invokes a previously developed pattern mining algorithm to cautiously enlarge the set of common genes. For validating the performance of the proposed method, we collected annotated TF associated pairs from diverse sources and constructed an answer set of various TF associations which mainly consists of protein-protein interactions, synergistic TF pairs, and piggy-back TF pairs. The predicting results are evaluated by the numbers of true positives (TPs) and the precision rates, defined by the value of TP over the total number of TPs and False positives. The result reveals that the discovered TFBSs successfully help to identify more known interacting TF pairs and simultaneously improve the precision of the methodology.

BIOGRAPHY

Ms. Mei-Ju May Chen was born in Taiwan on September 26, 1983. She is now a Ph.D. student of Genome and Systems Biology Degree Program co-organized by National Taiwan University (NTU) and Academia

Sinica in Taiwan. She holds a B.S. degree of Clinical Laboratory Sciences and Medical Biotechnology from NTU (2007) and a M.S. degree of Biomedical Electronics and Bioinformatics from NTU (2009).

Her research topics are recently focused on investigation of TF-TF associations in yeast and microarray analysis on children leukemia. These works are continued from her previous working experiences listed as follows: (a) RESEARCH ASSISTANT (Sep 2007-present): she works for a children leukemia project sponsored by Mackay Memorial Hospital, Taipei, Taiwan. This project is involved in two major topics. One is "the gene expression of HOXB genes between acute myeloid leukemia (AML) with mixed lineage leukemia (MLL) partial tandem duplication and AML with MLL translocations is significantly differentiated: a cross-laboratory study" and the other is "investigation of gene expression among TEL-AML1 patients in remission;" (b) RESEARCH ASSISTANT (Aug 2007-present): mining transcriptional factor binding sites in yeast genome. The methodology was published in *PNAS* in 2008 and then further applied on human genome; (c) PARTICIPANT (Feb 2006-Jun 2007): microarray analysis project – identifying high-confident estrogen receptor (ER) direct target genes by breast cancer microarray (published in *BMC Bioinformatics* in 2009). With the research experiences described above, her current research interests focus on gene regulation and the related predictions based on integration of different data sources such as protein-protein interaction, microarray and ChIP-chip data for investigating transcription factor association and transcriptional regulatory networks.

Session : D1-W3-T1: NEMS and MEMS

Session Organizer & Chair

Darrin J. Young, PhD (楊駿 教授)

Department of Electrical and Computer Engineering
The University of Utah, Salt Lake City, Utah, USA
Email: darrin.young@utah.edu

BIOGRAPHY

Darrin J. Young received his B.S., M.S., and Ph.D. degrees from the Department of Electrical Engineering and Computer Sciences at University of California at Berkeley in 1991, 1993, and 1999, respectively. He pioneered the research work in MEMS-based, high-Q, tunable capacitors and on-chip 3-D coil inductors for low-phase noise RF voltage-controlled oscillator (VCO) design for wireless communication applications. His doctoral thesis work demonstrated the first RF-CMOS VCO employing on-chip high-Q passive devices achieving the stringent GSM phase noise requirements. Dr. Young joined the Department of Electrical Engineering and Computer Science at Case Western Reserve University in 1999 as an assistant professor. In 2009 he joined the Electrical and Computer Engineering Department at the University of Utah as an USTAR associate professor. His research interests include micro-electro-mechanical systems design, fabrication, and integrated analog circuits design for wireless sensing, biomedical implant, communication, and general industrial applications. He has published many technical papers in journals and conferences, and served as a technical program committee member and session chair for a number of international conferences. Dr. Young is an associate editor of the IEEE Journal of Solid-State Circuits and chair of the IEEE Electron Devices Society MEMS Committee.

Session : ***D1-W3-T1: NEMS and MEMS***

Nanogenerator for Electric Clothing

Liwei Lin, PhD (林立偉 教授)

Department of Electrical and Computer Engineering
The University of Utah, Salt Lake City, Utah, USA
Email: darrin.young@utah.edu

ABSTRACT:

...

BIOGRAPHY

...

Session : ***D1-W3-T1: NEMS and MEMS***

Nanowire Electromechanical Devices and Systems - from Fundamentals to Emerging Technologies

Xiaoli Philip Feng, PhD (教授)

Department of Electrical and Computer Engineering
The University of Utah, Salt Lake City, Utah, USA
Email: darrin.young@utah.edu

ABSTRACT:

...

BIOGRAPHY

...

Session : D1-W3-T1: NEMS and MEMS

Low Power Sensing Electronics for High-Resolution Error-Correcting Biomechanical Ground Reaction Sensor Cluster

Darrin J. Young, PhD (楊駿 教授)

Department of Electrical and Computer Engineering
The University of Utah, Salt Lake City, Utah, USA
Email: darrin.young@utah.edu

ABSTRACT:

It is highly desirable to track a person's physical location in a GPS-denied environment, for example a fire fighter in a rescue mission or a traveler in a remote area. Commercially available inertial measurement units have been explored for such applications. However, these IMUs exhibit an excessive output drift over time, thus unsuitable for determining accurate position. It was recently demonstrated that a personal navigation system can be achieved by employing a high-resolution-gait-corrected IMU. The system combines a commercial IMU with a high-resolution, thin, flexible, error-correcting biomechanical ground reaction sensor cluster (GRSC). The IMU and GRSC will be placed within the heel and at the sole of a personnel boot and wirelessly connected to a handheld unit, which can process data in real-time. The high-resolution biomechanical GRSC can measure dynamic ground forces, shear strains, and sole deformation associated with a ground locomotion gait. These data can be used to detect periods of zero velocity accurately during the stance phase in a human bipedal locomotion to in turn provide correction to the IMU. This can drastically increase IMU effective positioning resolution and accuracy. This talk describes a low-power and low-interference sensing electronics to interface with the GRSC to accurately capture real-time dynamic response from a ground locomotion gait. The GRSC is composed of 13 x 13 sensing nodes. The integrated sensing electronics consist of a front-end multiplexer that can sequentially connect individual sensing nodes in a GRSC to a capacitance-to-voltage converter followed by an ADC, digital control unit, and driving circuitry to interrogate the GRSC. The sensing electronics are designed in a 0.15 μm CMOS process and occupy an area of approximately 3 mm^2 with an expected resolution of 10-bits and 14-bits for the z-axis pressure sensing and the x-y-axes shear strain sensing, respectively, while dissipating a DC power less than 2 mW from a 3V supply.

BIOGRAPHY

Darrin J. Young received his B.S., M.S., and Ph.D. degrees from the Department of Electrical Engineering and Computer Sciences at University of California at Berkeley in 1991, 1993, and 1999, respectively. He pioneered the research work in MEMS-based, high-Q, tunable capacitors and on-chip 3-D coil inductors for low-phase noise RF voltage-controlled oscillator (VCO) design for wireless communication applications. His doctoral thesis work demonstrated the first RF-CMOS VCO employing on-chip high-Q passive devices achieving the stringent GSM phase noise requirements. Dr. Young joined the Department of Electrical Engineering and Computer Science at Case Western Reserve University in 1999 as an assistant professor. In 2009 he joined the Electrical and Computer Engineering Department at the University of Utah as an USTAR associate professor. His research interests include micro-electro-mechanical systems design, fabrication, and integrated analog circuits design for wireless sensing, biomedical implant, communication, and general industrial applications. He has published many technical papers in journals and conferences, and served as a technical program committee member and session chair for a number of international conferences. Dr. Young is an associate editor of the IEEE Journal of Solid-State Circuits and chair of the IEEE Electron Devices Society MEMS Committee.

Session : D1-W4-T1: SoC/C4I

Session Organizer & Chair

Sao-Jie Chen, PhD (陳少傑 教授)

Graduate Institute of Electronics Engineering, National Taiwan University
No. 1, Sec. 4, Roosevelt Rd., Taipei, Taiwan
Tel: +888-6-2-3366-3647, Fax: +886-2-2363-8247
Email: csj@cc.ee.ntu.edu.tw

BIOGRAPHY

Sao-Jie Chen received the B.S. and M.S. degrees in electrical engineering from the National Taiwan University, Taipei, Taiwan, ROC, in 1977 and 1982 respectively, and the Ph.D. degree in electrical engineering from the Southern Methodist University, Dallas, USA, in 1988.

Since 1982, he has been a member of the faculty in the Department of Electrical Engineering, National Taiwan University, where he is currently a full professor. During the fall of 1999, he was a visiting professor in the Department of Computer Science and Engineering, University of California, San Diego, USA. During the fall of 2003, he held an academic visitor position in the Department of System Level Design, IBM Thomas J. Watson Research Center, Yorktown Heights, New York, USA. During the falls of 2004 to 2008, he was a visiting professor in the Department of Electrical and Computer Engineering, University of Wisconsin, Madison, USA. His current research interests include: VLSI physical design, SOC hardware/software co-design, and Wireless LAN and Bluetooth IC design.

Dr. Chen is a member of the Chinese Institute of Engineers, the Chinese Institute of Electrical Engineering, the Institute of Taiwanese IC Design, the Association for Computing Machinery, a senior member of the IEEE Circuits and Systems and the IEEE Computer Societies.

Session : ***D1-W4-T1: SoC/C4I***

System-on-Chip: Will Scaling Challenges Curtail Growth

Howard Ko, PhD (柯復華 資深副總)

Department of Electrical and Computer Engineering
The University of Utah, Salt Lake City, Utah, USA
Email: darrin.young@utah.edu

ABSTRACT:

...

BIOGRAPHY

...

Session : D1-W4-T1: SoC/C4I

Digital System Verification Using Massively Parallel Processor Arrays

Mike Bershteyn, PhD

Fellow, Cadence Design Systems
Tel: +1-408-428-5725, Fax: +1-408-914-6835
Email: bmike@cadence.com

ABSTRACT

Logic simulation does not belong to the class of problems that are embarrassingly easy to parallelize. Nevertheless, such parallelization is required in order to achieve simulation speed that does not grow proportionally to the system size. Field programmable gate arrays provide the required level of parallelism as long as system complexity does not exceed the capacity of few devices. Beyond this level of complexity, automatic system partitioning produces cut sizes that require deep time-division multiplexing of inter-device interconnect thus negating the speed advantage of parallelism. This paper describes massively parallel processor array architecture for digital system simulation. The array scales to the size required for mapping digital systems of extreme complexity. It is shown how static scheduling of message passing allows compiler to greedily schedule such systems for execution in constant amount of time. Practical considerations of system observability, controllability, external interfaces are discussed.

BIOGRAPHY

Mike Bershteyn was born in Kiev, Ukraine in 1952. Earned (the USSR equivalent of) PhD degree in computer science from Ukrainian Academy of Sciences Institute of Electrodynamics in Kiev, Ukraine, 1980.

He held various positions in software development for industrial automation, test and measurement. After immigrating to the USA in 1989, he worked at Mitsubishi Electric Research Laboratories as CAD development manager specializing in automatic test pattern generation and digital simulation. In 1995 he joined Quickturn Design Systems as director of software development for emulation. In 2001-2003 served as vice president of software engineering of Cognigine corporation. Since 2003 holds a position of fellow at Cadence Design Systems in San Jose, CA.

Dr. Bershteyn published a number of articles in the USSR technical journals, he is named as inventor in 9 US patents, presented papers at Design Automation Conference and International Test Conference, contributed to EDA for Integrated Circuits Handbook, CRC Press, 2006. In 1984 he earned the Ukrainian State Award for Outstanding Contributions to Science and Technology.

Session : ***D1-W4-T1: SoC/C4I***

The Challenge of System-Level Design

Andreas Kuehlmann, PhD (柯曼 博士)

Department of Electrical and Computer Engineering
The University of Utah, Salt Lake City, Utah, USA
Email: darrin.young@utah.edu

ABSTRACT:

The raise from gate-level to RTL design entry was driven by the need for higher design productivity. Specifically, RTL modeling allowed faster functional simulation and thus addressed the need for higher verification capacity to verify the growing system complexity. Furthermore, the availability of static timing analysis, formal equivalence checking between RTL and gate level, and automatic logic synthesis from RTL to gates supported a predictable automated implementation flow. The need for system-level modeling has similar motivations, mostly faster simulation for supporting early system validation and software development. However, there are significant differences. First, the level of abstraction needed for fast performance is significantly higher which results in a number of challenges for a consistent implementation flow. Second, there is no uniform level of model abstraction as large system models require a fine-tuned balance between modeling detail and performance for the different components. In this talk, we will provide an overview of the challenges in system level design and discuss a number of technologies that are currently available and under development.

BIOGRAPHY

[photo]

...

Session D1-W1-T2: New Energy, Environment and Sustainability

Session Organizer & Chair

Wei-Jen Lee, Ph. D (李偉仁 教授)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

BIOGRAPHY

...

Session : D1-W1-T2: New Energy, Environment and Sustainability

Electrochemical Energy Conversion and Storage - fuel Cells and Redox Battery

Kan-Lin Hsueh, PhD (薛康琳 教授)

Associate Professor, Department of Energy and Engineering, National United University
#1 Lien-Da Rd., Kung-Ching Li, Miaoli, 36003, Taiwan
Tel: +886-37-381397, Fax: +886-37-381237
Email: KanLinHsueh@hotmail.com

ABSTRACT

To search alternative energies other than fossil fuel and due to global eco-awareness, renewable energies play an important role in development of sustainable energy and reduction of carbon dioxide emission. Hydrogen fuel cell is a clean energy technology. It uses hydrogen as the fuel and uses fuel cell as the energy conversion device to generated electricity and heat. Hydrogen can be generated from water in couple with photovoltaic and wind power. High efficiency, zero emission, and low noise makes hydrogen fuel cell becoming one of the most promising energy technology in near future. Beside the space and military applications, hydrogen fuel cell has been successfully demonstrated as the power sources (1) for transportation application, such as electrical vehicles, bus, and motor cycles, (2) for stationary application, such as distributed power station, combined heat and power unit, un-interrupted power supplier, auxiliary power unit, (3) for portable electronics application, such as notebook, etc. The power generation rate of photovoltaic and wind power is not steady. Energy storage is needed for load leveling and power management. Many energy storage technologies are under development. Vanadium redox flow battery is one of the best candidates as electrical energy storage in kWh~MWh range for wind turbine, photovoltaic micro-grid energy balance and power management. The cell stack and system of PEMFC are similar to those of VRB. This presentation will be briefly introduced these green energy technologies, fuel cell for energy conversion and redox flow battery for energy storage.

BIOGRAPHY

Kan-Lin Hsueh was born at KeeLung, Taiwan in 1956. He graduated from Chung-Yuan Christian University (Taiwan) in 1977. He received Ph.D. from Clarkson University (USA) in 1984. Graduated works were in the area of fuel cell and energy storage battery. After graduated, he joined the Chem. Eng. Dept., National Tsing Hua University (Taiwan) as associate professor. Research projects were mainly in the area of II-VI semi-conducting material for optical fiber. In 1989, he moved to US and joined AMP Inc.

as a member of technical staff. In AMP Inc., he carried out research in the area of high-speed selective plating. Between 1999 and 2001, he studied the electrochemical etching of silicon micro-channel plate in NanoSciences Corp. In 2001, he joined ITRI (industrial Technology Research Institute) Taiwan, conducting research on DMFC (direct methanol, fuel cell) for portable devices and PEMFC (proton exchange membrane fuel cell) for stationary applications. He also served as the manager of PEMFC lab. Since 2008, he joined the Dept. of Energy and Resources, National United University. He started research in the area of fuel cell for energy conversion and battery for energy storage.

Session : D1-W1-T2: New Energy, Environment and Sustainability

Direct Conversion of Green Energy: from Quantum to System

Che-Wun Hong, PhD (洪哲文 教授)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT:

Direct conversion techniques of green energy are presented. Multi-scale fundamentals, including quantum mechanics, molecular dynamics, lattice Boltzmann modeling, computational fluid dynamics and control system dynamics are integrated to develop various green power engines, such as: fuel cells, photoelectrochemical solar cells, lithium batteries, ultra-capacitors and thermoelectric generators for applications ranging from small potable power to large scale distributed power generation systems. Computer simulation was performed to evaluate the feasibility of the above green technologies to replace the traditional combustion engines. System-scale control strategies, macro- and micro-scale electrochemical performance design as well as nano-scale material optimizations are all covered in the research direction of my Green Energy & Molecular Engineering Lab aiming at the ultimate target of high efficiency green power conversion without any pollution.

BIOGRAPHY

Prof. Che-Wun Hong was born in Kaohsiung city, Taiwan on March 15th, 1956. He received bachelor degree in Mechanical Engineering from National Cheng-Kung University in 1978. After graduation from the university, he served in the army as an armored vehicle officer (1978~1980), then worked as a mechanical engineer in the Ford Motor Company (1980~1981), and then transferred to the Industrial Technology Research Institute (ITRI) as an engine researcher (1981~1982). In the fall of 1982, after saving enough money, he went to United Kingdom to study higher degrees. He received his MSc degree from the UMIST (Manchester, UK) in 1983 and a PhD degree from the Imperial College (London, UK) in 1987, all majored in Mechanical Engineering.

In 8/1987, he returned to Taiwan and joined the Department of Power Mechanical Engineering of National Tsing Hua University as an associate professor. He was promoted to full professor in 1997. Being a faculty member for 23 years, his research area ranges from internal combustion engines, turbochargers to the automotive engineering; and then he switched to the green power engineering at the millennium. His current research focuses on the fuel cells, solar cells, lithium-ion batteries, ultra-capacitors and thermoelectric chips by means of the academic fundamentals, such as: quantum mechanics, molecular dynamics, Boltzmann modeling, computational fluid dynamics and control system dynamics. He has published more than 200 technical papers, including archived journals, proceedings of national and international conferences and technical reports; also he has registered for two patents in Taiwan and USA.

Session : D1-W1-T2: New Energy, Environment and Sustainability

Smart Grid – Demand-Side Perspectives

Edwin Liu, PhD

VP, Quanta Technology
Email: eliu@quanta-technology.com

ABSTRACT

President Barack Obama said: "We'll fund a better, smarter electricity grid and train workers to build it --- a grid that will help us ship wind and solar power from one end of this country to another.""Think about it. The grid that powers the tools of modern life --- computers, appliances, even BlackBerrys --- looks largely the same as it did half a century ago." This gave a major government commitment on the smart grid revolution. The smart grid's initial efforts, now backed with the largest single grid modernization investment in U.S. history among other investment grants, continues to develop without bounds. What began as a theoretical idea has increasingly become a reality; 54 workforce training initiatives have been selected to receive just shy of 100 million dollars to train new hires and to develop new strategies and training curriculum for the future. Close to $10 billion investments from both government and industry will introduce major activities in the next 3-5 years as the main momentum of the energy industry transformation.

With all these efforts, the main business drives can be categorized into three main areas: customer participation, emission awareness, and utility operation & planning. The final smart grid benefit recipient should be the consumers. The US Energy Secretary, Steve Chu, said: "To assuage consumers who are resistant to changing their habits, energy savings in the home has to be incredibly simple … Much like a point-and-shoot camera that lets consumers simply push a button to take a picture, but possess the ability to do much more embedded in the device … Real-time pricing will lead to demand response and, if done right – meaning consumers are given the right tools, like this "magic button" – energy costs will be driving down." So, in the near term, we should empower the consumers so that they can actively participate in the power grid operation and planning through demand response or other distributed energy resources; in the long term, we need to address how to build a smart grid that is consumer-centric, and capable of balance multiple-attributes (societal constraint verses individual consumer needs versus system operation constraints.)

In this presentation, we will address the demand-side smart grid activities --- from the energy industry transformation to the challenges and issues faced by smart grid development. The pathway of developing a consumer focused smart grid will also be discussed, including the integration of home automation, demand-side management, demand response, and electrification of transportation. Several practical considerations, such as privacy, technology adoption, benefits to consumers of smart grid efforts will be presented.

BIOGRAPHY

Dr. Edwin Liu, *Vice President of Strategy Initiatives and Smart Grid, Quanta Technology, LLC,* has more than 28 years of experience in consulting, research, and development on power system analytics and integration, both in industry and academia. Throughout his career, he has been with universities, software vendors, utility and consulting companies - focusing on applying state-of-the-art technologies to energy utility and industry. His expertise is on smart grid, information integration, power system optimization, electricity market modeling, energy and emission management, automation, technology innovation, and business strategy. In Quanta, Edwin is responsible for business initiatives in the smart grid and energy management areas, including analytical applications, automation, and integration. He is actively involved in the California smart grid projects. Dr. Liu is an experienced technical project manager and is equipped with interdisciplinary domain expertise.

Edwin received his BS degree in Electrical Engineering from National Taiwan University; MS and PhD in Electrical Engineering and Computer Sciences, both from University of California, Berkeley. Dr. Liu is an IEEE Fellow for his contributions to the development of state estimation and optimal power flows, and their integration in utility systems. He was the Chairman of the IEEE Computing and Analytical Methods Subcommittee. Dr. Liu was an advisor to the National Science Council, Taiwan. He serves as the industry advisor at the Energy Systems Research Center, University of Texas, and the visiting scholar at the Department of Electrical Engineering, Xi'An JiaoTong University. Before joined Quanta Technology, he has worked for Siemens, Pacific Gas and Electric Company, Bechtel, and was a member of the start-up management team of Nexant.

Session D1-W2-T2: Medicine

Session Organizer & Chair

Wen-Yih Isaac Tseng, Ph. D (曾文毅 教授)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

BIOGRAPHY

...

Session : D1-W2-T2: Medicine

Epigenetic Control of Heart Development and Disease

Ching-Pin Chang, PhD (張景濱 教授)

CCSR 3115, 269 Campus Drive
Division of Cardiovascular Medicine, Stanford,
California, USA
Tel: +1-650-736-8539, Fax: +1-650-723-6903
Email: chingpin@stanford.edu

ABSTRACT

Epigenetic control of heart development and disease

Calvin T. Hang (1), Pei Han (1), Jin Yang (1), Hsiu-Ling Cheng (1), Euan Ashley (1), Bin Zhou (2), Ching-Pin Chang* (1)

(1) Division of Cardiovascular Medicine, Department of Medicine, Stanford University, California, USA
(2) Department of Genetics, Albert Einstein College of Medicine, New York, USA

Cardiac hypertrophy and failure are characterized by transcriptional reprogramming and fetal gene activation, which correlate with cardiac performance and clinical outcome. Adult cardiomyocytes in mice are post-mitotic and express mainly α-myosin heavy chain (α-MHC), whereas embryonic cardiomyocytes are highly proliferative and express primarily β-MHC. Adult hearts under stress develop hypertrophy, accompanied by a shift from α-MHC to fetal β-MHC, leading to contractile dysfunction and heart failure. Mechanisms bridging the developmental and pathological gene expression are not well understood. We show that Brg1, a core ATPase component of the BAF chromatin-remodeling complex, has a critical role in regulating cardiac growth, differentiation and gene expression. In embryos, *Brg1* promotes myocyte proliferation by maintaining *Bmp10* and suppressing a CDK inhibitor, $p57^{kip2}$. In parallel, Brg1 preserves fetal cardiac differentiation by interacting with histone deacetylases (HDACs) and poly (ADP ribose) polymerase (PARP) to repress α-*MHC* and activate β-*MHC*. In adults, *Brg1* expression is turned off in cardiomyocytes. It is reactivated by cardiac stresses and forms a complex with its embryonic partners, HDAC and PARP, to induce a pathological shift from α- to β-*MHC*. Preventing *Brg1* re-expression decreases hypertrophy, abolishes fibrosis and reverses the pathological *MHC* switch. *BRG1* is activated in certain patients with hypertrophic cardiomyopathy. Its level correlates with disease severity and *MHC* changes, suggesting a role of BRG1 gene in human hypertrophic heart disease. Our studies thus uncover a role of Brg1 in maintaining cardiomyocytes in an embryonic state, and an epigenetic mechanism by which three chromatin-modifying factors-Brg1, HDAC and PARP-cooperate to control developmental and pathological gene expressions. BRG1 may constitute a therapeutic target for cardiomyopathy and heart failure.

BIOGRAPHY

A. Academic history:

Colleges and universities attended, degrees received, dates.

9/1983-6/1990	MD	National Taiwan University (*summa cum laude*) Taipei, Taiwan
9/1992-6/1997	PhD	Stanford University - Cancer Biology Stanford, California

Scholarships and honors:

1983-1990	National Taiwan University, Dean's Lists & Dean's Awards
1989	Harvard Medical School, Exchange Student selection

Post-doctoral and residency training:

7/1/97-6/30/99 Internship and Residency, Internal Medicine

Massachusetts General Hospital, Harvard University, Boston, Massachusetts

7/1/99-6/30/01 Clinical Cardiology Fellowship

Stanford University School of Medicine, Stanford, California

7/1/01-6/30/04 HHMI Physician-Scientist Fellowship

Stanford University School of Medicine, Stanford, California

7/1/99-6/30/04 Fellowship, Clinical Investigator Pathway, Cardiovascular Medicine

Stanford University School of Medicine, Stanford, California

Board eligibility and boards passed, with date(s):

1990 Certified, Medical Practice by Department of Health, Taiwan

	Certificate No.: 019958
1991-1992	Certified, Educational Commission for Foreign Medical Graduates (ECFMG) Certificate No.: 0-468-016-1
1996-1998	U.S. Medical Licensing Exam (USMLE) Passed
2000	A.B.I.M. Certification, Internal Medicine Certificate No.: 197361
2004	A.B.I.M. Certification, Cardiovascular Disease Certificate No.: 197361

Licensure

7/1999 California Medical License #A69033

B. Employment history: List all academic and non-academic positions.

Academic positions:

7/1/04-12/31/04	Research Associate, Department of Pathology Stanford University School of Medicine
10/1/04-1/31/05	Acting Assistant Professor of Medicine, Cardiovascular Medicine Stanford University School of Medicine, Stanford, CA
2/1/05-pres	Assistant Professor of Medicine, Cardiovascular Medicine Stanford University School of Medicine, Stanford, CA

C. Public and professional service.

7/1990 – 8/1992 Medical Officer, Second Lieutenant, National Army, Taiwan

National

8/2006	Moderator, Undergraduate Research Roundtable Faculty, Undergraduate Research Training Program American Heart Association, CA
11/06-10/07	American Heart Association, Western Review Consortium Peer Review Committee 2B (Integrative Cardiology and Physiology; Rob MacLellan, Chair)
10/12/2007	American Heart Association, National Center Peer Review Committee BASIC 3 (Basic Science & Molecular Biology 3 Study Group; Richard Anderson, Chair)

D. Post-degree honors and awards

Honors and awards

1990	National Taiwan University Hospital, Best Intern Award

1990	National Taiwan University Medical School
2000	American College of Cardiology, Travel Award
2001 - 2004	Howard Hughes Medical Institute, Physician-Scientist Fellowship Award
3/8/2004	Keystone Symposia Award, International Keystone Symposia Scholarship for Molecular Biology of Heart Disease, Cardiac Development and Congenital Heart Disease, Keystone, CO
5/13-16/2004	Weinstein Award, International Weinstein Cardiovascular Development Conference, Leiden, Netherlands
2005	National Scientist Grant Award, American Heart Association
2006	Donald E. and Delia B. Baxter Foundation Faculty Scholar Award
2007	Children's Heart Foundation, Medical Research Grant Award
2007	March of Dimes Foundation, Research Award
2009	California Institute of Regenerative Medicine, New Faculty Award

E. Publications

Hang C, Yang J, Han P, Cheng HL, Ashley E, Zhou B, Chang CP. Chromatin regulation by Brg1 underlies heart muscle development and disease. *Nature* 2010; 466(7302): 62-67

Stankunas K, Hang C, Tsun ZY, Chen H, , Lee NV, Wu J, Shing C, Baylor JH, Shou W, Iruela-Arispe L, Chang CP. Endocardial Brg1 represses ADAMTS1 proteases to maintain the microenvronment for myocardial morphogenesis. *Dev. Cell* 2008 Feb;14(2):298-311.

Chang CP, Neilson JR, Bayle JH, Gestwicki JE, Kuo A, Graef IA, Crabtree GR. A field of myocardial-endocardial NFAT signaling underlies heart valve morphogenesis. *Cell* 2004 Sept; 118, 649-663.

Session D1-W2-T2: Medicine

Imaging Technology for Personalized Medicine

Wen-Yih Isaac Tseng, Ph. D (曾文毅 教授)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT

...

BIOGRAPHY

...

Session D1-W2-T2: Medicine

Electrical Stimulation of Degenerate Retina towards the Development of Prosthetic Vision for the Blind

Leanne Lai-Hang Chan, Ph. D (陳儷行 博士)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT

...

BIOGRAPHY

...

Session D1-W3-T2: Nanotechnology

Session Organizer & Chair

Chih-hung (Alex) Chang, PhD (張至弘 教授**)**

School of Chemical, Biological and Environmental Engineering
Oregon State University
Corvallis OR 97331, USA
Tel: +1-541-737-8548, Fax: +1-541-737-4600
Email: changch@che.orst.edu

BIOGRAPHY

Chih-hung (Alex) Chang was born in Taipei, Taiwan 1969. He received a B.S. degree from the Department of Chemical Engineering, National Taiwan University in June 1991. He received his PhD degree in chemical engineering from University of Florida, Gainesville Florida in December 1999.

He did a research project to study deposition of thin film platinum on titanium substrates using electrochemical methods. He received a graduate fellowship from the Department of Chemical Engineering, University of Florida, and started the graduate program in August 1994. His dissertation research concerned the development of a manufacturing process for the growth of thin-film photovoltaic cells using rapid thermal processing under Prof. Timothy J. Anderson's guidance. He joined Oregon State University in January, 2000. He is currently a full professor in the School of Chemical, Biological, and Environmental Engineering. He was a visiting professor in the Materials Science and Engineering Department at National Taiwan University from April 2008 till September 2008 sponsored by the National Science Council of Taiwan.

Prof. Chang is a member of a number of professional societies including American Institute of Chemical Engineers, The Electrochemical Society, American Vacuum Society, American Chemical Society, and Material Research Society. He is a SHARP Labs of America scholar and a recipient of AVS Graduate Research award, National Science Foundation's CAREER award, and awardees of W.M. Keck Foundation. His group has studied solution based thin film deposition processes, ink jet printing, microreaction technology, and X-ray absorption fine structure. He has more than 55 refereed publications, 2 issued patents, and 10 pending patents in these areas.

Session D1-W3-T2: Nanotechnology

Nanoporous Membranes Formed by Interferometric Lithography

Joseph W. Tringe, PhD (特林其 博士)

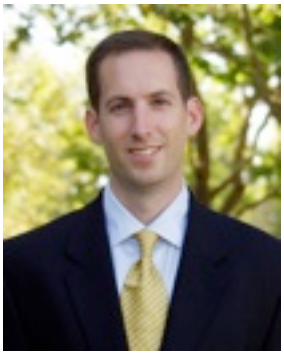
Staff Scientist, Lawrence Livermore National Laboratory
7000 East Avenue, L-183 • Livermore, CA 94550, USA
Tel: +1-925-422-7725, Fax: +1-925-422-2499
Email: tringe2@llnl.gov

ABSTRACT

Membranes with nanometer-scale pores have demonstrated utility for molecular sensing, separation and water purification. Among the most common and useful molecular sieves available today are polycarbonate track-etched (PCTE) and anodic aluminum oxide (AAO) membranes. A new class of membranes based on carbon nanotubes is also very promising. For molecular sensing and separation applications, thinner membranes (100s of nm and below) have potential for enhanced molecular transport rates as well as reduced clogging due to the relatively short times that molecules spend in proximity to pore walls. Ultra-thin membranes in polycrystalline silicon have been demonstrated, for example, with excellent transport properties.

Here I present a general technology based on interferometric lithography for making uniform arrays of pores in membranes. Interferometric lithography employs two or more lasers overlapping in a photosensitive material to create a periodic pattern. The approach is promising for large-scale manufacturing of nanoporous membranes because it can function without a mask over large areas, and can be readily used to create deep sub-wavelength features. I will present molecular transport results obtained on membranes formed by interferometric lithography, as well as molecular dynamics simulations obtained with the ESPResSo (Extensible Simulation Package for Research on Soft matter) code, to demonstrate the functionality and utility of this class of nanoporous membranes.

BIOGRAPHY



Joe Tringe received a bachelor's degree in physics from Harvard University (Cambridge, Massachusetts) in 1994, and the Ph.D. degree in materials engineering from Stanford University (Stanford, California) in 2000.

He served in the U.S. Air Force at Kirtland Air Force Base, New Mexico, as Group Leader for the Air Force Research Laboratory's radiation-hard electronics development program, then joined Lawrence Livermore National Laboratory in Livermore, California, where he is presently a Staff Scientist. He is concurrently a Reserve Officer and Program Manager attached to the U.S. Air Force Asian Office of Aerospace Research and Development in Tokyo, Japan. His research interests include nanoporous membranes, materials for sensing and energy conversion, and energetic materials. He is a member of the American Physical Society, IEEE, and the Materials Research Society.

Session D1-W3-T2: Nanotechnology

Opportunities and Challenges in Developing Flexible Organic Electronics

Samuel Graham, PhD (葛蘭姆 教授)

Associate Professor of Mechanical Engineering
Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA 30038.
Email: **sgraham@gatech.edu**

ABSTRACT

The development of organic electronics provides exciting opportunities to enable a wide range of flexible electronics. Both solution processed and small molecule materials have shown incredible performance in the areas of field effect transistors, electrochromics, displays, and solid state lighting, while photovoltaics have recently shown power conversion efficiencies over 8%. While much improvement in the active electronic materials has been made, many challenges remain when developing low cost devices on flexible substrates. Transparent polymer substrates have become the material of choice for flexible organic electronics, but have limited processing temperature range which impacts subsequent manufacturing steps which are used to create organic electronic devices. In addition, the need for barrier films and edge selants which prevent the ingress of moisture and oxygen are paramount to the long term stability of these devices. Finally, the mechanical response and reliability of laminar soft and hard materials must be understood in order to better design flexible devices which can withstand repeated flexural deformation.

In this talk, we will discuss some of the challenges and advancements in developing organic electronics for flexible applications. The talk will cover manufacturing techniques, the development of flexible electrodes, packaging, and mechanics of organic electronics. The talk will focus of applications including organic solar cells, LEDs, and electrochromics. Future challenges which must be addressed to push this technology forward will be discussed.

BIOGRAPHY

[photo]

Samuel Graham is an Associate Professor of Mechanical Engineering at the Georgia Institute of Technology. He currently serves as the Organic Electronics Thrust Leader in the National Science Foundation's Science and Technology Center: Materials and Devices for Information Technology Research. Here, he leads a group of researchers developing packaging methods for organic electronics and the development of OFETs and OPVs. Other aspects of his work focus on the reliability and thermal management of electronics including wide band gap solid state lighting sources. Prior to joining Georgia Tech, he was a Senior Member of Technical Staff at Sandia National Laboratories and a visiting Researcher at Stanford University.

Session D1-W4-T2: Medical System-on-Chip

Session Organizer & Chair

Kea-Tiong Samuel Tang, PhD (鄭桂忠 教授**)**

School of Chemical, Biological and Environmental Engineering
Oregon State University
Corvallis OR 97331, USA
Tel: +1-541-737-8548, Fax: +1-541-737-4600
Email: changch@che.orst.edu

BIOGRAPHY

...

Session D1-W4-T2: Medical System-on-Chip

Low-power Analog Front-end Circuits for Healthcare System and Telemetry Devices

Shuenn-Yuh Lee, PhD (李順裕 教授**)**

Associate Professor of Mechanical Engineering
Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA 30038.

ABSTRACT

...

BIOGRAPHY

...

Session D1-W4-T2: Medical System-on-Chip

Towards an Electronic Nose System-on-Chip

Kea-Tiong Samuel Tang, PhD (鄭桂忠 教授**)**

School of Chemical, Biological and Environmental Engineering
Oregon State University
Corvallis OR 97331, USA
Tel: +1-541-737-8548, Fax: +1-541-737-4600
Email: changch@che.orst.edu

ABSTRACT

...

BIOGRAPHY

...
...

Session D1-W4-T2: Medical System-on-Chip

Low-power Analog Front-end Circuits for ECG Acquisition Systems

Tsung-Heng Tsai, PhD (蔡宗亨 教授)

School of Chemical, Biological and Environmental Engineering
Oregon State University
Corvallis OR 97331, USA
Tel: +1-541-737-8548, Fax: +1-541-737-4600
Email: changch@che.orst.edu

ABSTRACT

...

BIOGRAPHY

...

...

Workshops 1 & 3 Keynote: New Energy/Nanotechnology/NEMS

Chair

Che-Wun Hong, Ph. D (洪哲文 教授)

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

BIOGRAPHY

Prof. Che-Wun Hong was born in Kaohsiung city, Taiwan on March 15th, 1956. He received bachelor degree in Mechanical Engineering from National Cheng-Kung University in 1978. After graduation from the university, he served in the army as an armored vehicle officer (1978~1980), then worked as a mechanical engineer in the Ford Motor Company (1980~1981), and then transferred to the Industrial Technology Research Institute (ITRI) as an engine researcher (1981~1982). In the fall of 1982, after saving enough money, he went to United Kingdom to study higher degrees. He received his MSc degree from the UMIST (Manchester, UK) in 1983 and a PhD degree from the Imperial College (London, UK) in 1987, all majored in Mechanical Engineering.

In 8/1987, he returned to Taiwan and joined the Department of Power Mechanical Engineering of National Tsing Hua University as an associate professor. He was promoted to full professor in 1997. Being a faculty member for 23 years, his research area ranges from internal combustion engines, turbochargers to the automotive engineering; and then he switched to the green power engineering at the millennium. His current research focuses on the fuel cells, solar cells, lithium-ion batteries, ultra-capacitors and thermoelectric chips by means of the academic fundamentals, such as: quantum mechanics, molecular dynamics, Boltzmann modeling, computational fluid dynamics and control system dynamics. He has published more than 200 technical papers, including archived journals, proceedings of national and international conferences and technical reports; also he has registered for two patents in Taiwan and USA.

Workshops 1 & 3 Keynote: New Energy/Nanotechnology/NEMS

...

Friedrich B. Prinz, PhD

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT

...

BIOGRAPHY

...

Workshops 4 Keynote: SoC/C4I

Chair

Liang-Gee Chen, Ph. D (陳良基 副院長**)**

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

BIOGRAPHY

...

Workshops 4 Keynote: SoC/C4I

Chip Design and Implementation Service in Taiwan

Chin-Long Wey, PhD (魏慶隆 主任**)**

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

ABSTRACT

...

BIOGRAPHY

...

Session D1-W1-T3: New Energy, Environment and Sustainability

Session Organizer & Chair

Grace Lin, PhD (林蔚君 教授)

School of Chemical, Biological and Environmental Engineering
Oregon State University
Corvallis OR 97331, USA
Tel: +1-541-737-8548, Fax: +1-541-737-4600
Email: changch@che.orst.edu

BIOGRAPHY

...

Session D1-W1-T3: New Energy, Environment and Sustainability

Smart Water Management

Peter Williams (威廉斯 先生**)**

School of Chemical, Biological and Environmental Engineering
Oregon State University
Corvallis OR 97331, USA
Tel: +1-541-737-8548, Fax: +1-541-737-4600
Email: changch@che.orst.edu

ABSTRACT

...

BIOGRAPHY

...

...

Session D1-W1-T3: New Energy, Environment and Sustainability

High Pressure Soda Pop - How Can We Use It Greenly?

H. Bruce Li, PhD, PE (李曉遠 總裁)

President and CTO
GhG SaviorTech Corp.
1681 Firman Dr. Suite 103
Richardson, TX 75081
Tel: +1-972-841-5583, Fax: +1-972-301-9980
Email: bli@GhGSaviorTech.com

ABSTRACT

GhG SaviorTech is building a demonstration plant on the shore of Lake Lavon northeast of the City of Garland, Texas. It converts existing carbon dioxide emission from flue gas into soda ash via partial Solvay process. In the step of making soda ash from the baking soda obtained from the Solvay process, half of the captured CO_2 normally was reemitted into the atmosphere. In this important step of "reflux", we pay particular attention first to pump out air, thus not letting N_2, O_2 mixing with CO_2 and H_2O. Pure, one to one molar ratio of CO_2 and H_2O are obtained.

This article discusses our innovative way to utilizing this high pressure soda pop.

At room temperature up to the boiling point of water, which is the range of temperature that reflective or refractive solar heating almost free of cost, the CO_2 and H_2O mixture follows an equation known as Krichevsky-Kasarnovsky equation. The pressure change can easily be manipulated to drive a hydraulic press for useful purpose such as pumping water from one region to another, or propel a slow moving ship carrying merchandise that does not require express delivery.

We have filed a Patent Application titled "Sub-Hertz solar powered Kalina Engine".

If you want to learn more in detail, please join the session.

BIOGRAPHY

Dr. Li was born in Hangzhou, China 1935. Moved to Taiwan at age 13, and spent 13 year there until 1961, then immigrated to the US until now. He holds a B. S. in Chemical Engineering from National Taiwan University, an M. S. and a Ph. D. in Chemical Physics from Oklahoma State University. He obtained his Chemical. Engineering Professional Engineer license in one sitting, with a high score of Fundamentals of Engineering Examination of **197** against a passing score of **93.**

He was employed by Texas Instruments for 16 years, then retired as a Federal Employee at age 63. He started **21-Century Silicon, Inc.** a solar grade silicon manufacturer, in 2005, and another company, **GhG SaviorTech Corporation**, for **CCP (Carbon Capture for Profit)**, in 2007. He serves as President & CTO for both Companies.

Session D1-W1-T3: New Energy, Environment and Sustainability

Trends of Green Vehicle Development

Yi-Hsuan Hung, PhD (洪翊軒 教授)

Department of Industrial Education, National Taiwan Normal University
162, He-ping East Road, Sec. 1, Taipei 10610, Taiwan
Tel: +886-2-7734-3377, Fax: +886-2-392-9449
Email: hungyh@ntnu.edu.tw

ABSTRACT

Global trends in developing green vehicles are presented. Various green power sources, such as: PEM fuel cells, lithium batteries and ultra-capacitors and traction motors/generators are utilized for advanced powertrains nowadays. Such devices have their unique strength but also with their weakness. To minimize drawbacks and to maximize output performance, hybrid architecture is needed. For global automotive enterprises, design philosophies and technology development are divergent. In this talk, the comparison in their development strategies of vehicle designs and key components will be conducted. Meanwhile, the current status of green vehicle development in Taiwan will be mentioned. Technologies, government subsidies and policies, prototyping products are introduced here. The prediction of world-wide trends and international cooperative opportunities for Taiwan automotive industry will be discussed at the final part of this talk.

BIOGRAPHY

Dr. Yi-Hsuan Hung was born in Taipei city, Taiwan on Nov. 12th, 1974. He received his BSc, MSc, and Ph.D. degrees from Power Mechanical Engineering from National Tsing-Hua University in 1997, 1999 and 2004, respectively. After graduation, he served in the army in 2005 and then transferred to the Industrial Technology Research Institute (ITRI) as a researcher (2005~2009). During the working period in ITRI, he was a project manager/department manager of the Electric Propulsion & Battery Management Dept., also the director of the Next Generation Energy & Power Lab., and leader of several government-funded projects.

In 8/2009, he joined the Department of Industrial Education of National Taiwan Normal University as an assistant professor. His current research focuses on fuel cells, lithium-ion batteries, ultra-capacitors and various types of advanced vehicles by means of academic fundamentals, such as: graphical modeling

approaches, control strategy applications, optimal designs, real-time modeling techniques. He has published more than 35 technical papers, including journals, proceedings of domestic/international conferences, and over 35 technical reports. Also he has registered for 8 patents in Taiwan and USA. He has completed over 30 public speeches to promote the concept of green energies and to share experiences on developing advanced vehicles.

Session : ***D1-W2-T3: Bioinformatics***

Session Organizer & Chair

Jung-Ying Tzeng, PhD (曾仲瑩 教授**)**

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

BIOGRAPHY

...

*Session : **D1-W2-T3: Bioinformatics***

Correcting Population Stratification in Genetic Association Studies Using a Phylogenetic Approach

Li-San Wang, PhD (王立三 教授**)**

Assistant Professor of Pathology and Laboratory Medicine
Institute on Aging / Penn Center for Bioinformatics
University of Pennsylvania
Philadelphia, Pennsylvania 19104
Email: lswang@mail.med.upenn.edu

ABSTRACT

...

BIOGRAPHY

Li-San Wang received his B.S. (1994) and M.S. (1996) in Electrical Engineering from the National Taiwan University. He received his M.S. (2000) and Ph.D. (2003) from the University of Texas at Austin, both in Computer Sciences, and was a postdoctoral fellow at the University of Pennsylvania between 2003 and 2006. Currently he is an Assistant Professor of Pathology and Laboratory Medicine and a fellow of the Institute on Aging, University of Pennsylvania. Dr. Wang's research interests include phylogenetics, comparative genomics, and microarray analysis. He has authored twenty six peer-reviewed book chapters and journals on computational biology and bioinformatics, and served on the program and organizing committees of several international workshops and conferences.

Session : D1-W2-T3: Bioinformatics

The Past, Present and Future of Genome-wide Association Study (GWAS)

Kei-Hang Katie Chan (陳紀行)

Graduate Student Researcher
University of California, Los Angeles
Email: katiekhchan@ucla.edu

ABSTRACT

...

BIOGRAPHY

...

Session : ***D1-W2-T3: Bioinformatics***

Development of an Environmentally Benign, Multifunctional Biomedical Surface Treatment System Using an Atmospheric-Pressure Plasma Jet

Jong-Shinn Wu, PhD (吳宗信 教授**)**

Department of Mechanical Engineering, National Chiao Tung University
1001 Ta-Hsueh Road, Hsinchu 30010, Taiwan
Tel: +886-3-573-1693, Fax: +886-3-611-0023
Email: chongsin@faculty.nctu.edu.tw

ABSTRACT

In this talk, the development of an environmentally benign, flexible, large-area, high-throughput and multi-functional biomedical surface treatment system (named MBSTS hereafter) is presented. The MBSTS is capable of carrying out: 1) dry sterilization/inactivation, 2) dry hydrophilicity improvement, and/or 3) dry biocompatible functionalization of amine for the surface of bare glass, PLA and UHMWPE by using the technology of nitrogen-based parallel-plate DBD-type atmospheric-pressure plasma jet (APPJ). As compared to the conventional methods, e.g., chitosan, for amine functionalization, the required treatment time before efficient cell culture decreases greatly from 5-10 hours down to less than 5-10 minutes, in addition to the very low cost, because nitrogen is used and there is no vacuum equipment needed, and the environmental benignity due to its totally dry treatment. Several examples of surface treatment and possible applications are presented in the meeting.

BIOGRAPHY

Prof. Jong-Shinn Wu was born in Tainan city, Taiwan on 2nd March 1964. He received bachelor degree in Mechanical Engineering from National Taiwan University in 1986. Later on, he received his MS degree in the same department in 1988. Then, he served in the army as a lecturer in the military high school (1988~1990). Right after the military service, he went to the University of Michigan (USA), working on optical diagnostics of turbulence phenomena pertinent to sprays, and received his PhD degree in Aerospace Engineering in 1994. He continued to work as a postdoctoral research fellow in the same department, conducting research on the measurements of optical properties of soot resulting from flames. In late of 1995, he returned to Taiwan and worked as an engineer at National Space Organization of Taiwan on the subject of thermal vacuum test for satellites. In 1998, he joined the Department of Mechanical Engineering at National Chiao Tung University as an assistant professor. He was promoted to a full professor in 2005. His current research interests include development of hybrid rocket system, simulation of rare-

fied gas dynamics (DSMC), low-temperature plasma physics and applications, development of advanced kinetic-based numerical schemes for gas flows and large-scale parallel scientific computing (MPI and GPU). He has published more than 50 referred international journal papers and 100 international and national conference papers. He is also the associate editor of the International Journal for Plasma Science and Engineering since 2008 and has served as the International Advisory Committee member for both the Asia CFD Conference and the International Conference on Parallel CFD since 2010.

Session : D1-W3-T3: Nanotechnology

Session Organizer & Chair

Hsuan-Liang (Kevin) Liu, PhD (劉宣良 所長)

Distinguished professor, Department of Chemical Engineering and Biotechnology
National Taipei University of Technology, Taipei 10608 Taiwan
Tel: +886-2-27712171-2542, Fax: +886-2-27317117
Email: f10894@ntut.edu.tw

BIOGRAPHY

Prof. Hsuan-Liang (Kevin) Liu was born in Keelung, Taiwan on Nov. 13, 1969. He received his B.S. and Ph.D degree in the field of Chemical Engineering in 1991 and 1998 from National Taiwan University and Iowa State University, respectively. Prof. Liu's research fields are computational biology, bioinformatics, proteomics, and genetic & protein engineering.

He has been working in the Department of Chemical Engineering and Biotechnology of National Taipei University of Technology (NTUT) for eleven years. He was promoted as a distinguished professor in August 2008 due to his outstanding academic performance. He has received three and two times of the Outstanding Research Awards from the College of Engineering of NTUT and NTUT, respectively. He joined the member of the Taiwan Institute of Chemical Engineering and received the Young Research Fellow Award in 2004. To date, he has published around 100 SCI papers with high quality, including those in Proteomics, Bioinformatics, Current Protein & Peptide Science, Chemical Physics Letters, Biotechnology Progress, Chemical Engineering Journal, etc. His current research interests include molecular dynamics simulations, molecular docking, pharmacophore-based and structure-based virtual screening, and computer-aided drug design.

Prof. Liu is currently a member of the American Chemical Society, the Taiwan Institute of Chemical Engineering, and the Taiwanese Chemical Society. He is also the chair of the Graduate Institute of Biotechnology of NTUT. By continuous devoting his effort in the academic society, Prof. Liu has received high reputation in his country.

*Session : **D1-W3-T3: Nanotechnology***

...

William M. Tong, PhD (唐文偉 博士)

Assistant Professor of Pathology and Laboratory Medicine
Institute on Aging / Penn Center for Bioinformatics
University of Pennsylvania
Philadelphia, Pennsylvania 19104
Email: lswang@mail.med.upenn.edu

ABSTRACT

...

BIOGRAPHY

...

Session : D1-W3-T3: Nanotechnology

Mesoporous Materials for Biomedical and Energy Applications

Chia-Wen (Kevin) Wu, PhD (吳嘉文 教授**)**

Assistant Professor, Department of Chemical Engineering, National Taiwan University
No.1, Sec. 4, Roosevelt Road, Taipei 10617, Taiwan
Tel: +886-2-3366-3064, Fax: +886-2-2362-3040
Email: kevinwu@ntu.edu.tw

ABSTRACT

Mesoporous silica materials were independently discovered in early 1990 independently by both Prof. Kuroda's group (FSM series) in Japan and by Mobil company (MCM series) in USA. Since then, mesoporous materials have attracted great attention due to many advantages of these materials, *e.g.* high surface area (over 1000 m^2/g), ordered mesostructure (2D hexagonal, 3D cubic), uniform and tunable pore size (2 to 10 nm), abundant silanol groups on the surface, robust and biocompatible framework, various compositions (silica, titania) and morphologies (nanoparticles, films). These materials have also shown promise in catalysis, optics, separations, and bio-applications.

In this talk, I will introduce the research accomplishments on mesoporous materials that are synthesized through a combination of chemistry and engineering. The content will include three categories: synthesis, lithography-assisted micropatterning, and applications toward biomedical and energy.

(1) Synthesis: Mesoporous materials are generally synthesized through a sol-gel process of inorganic species (*e.g.* silicon alkoxides) in the presence of self-assembled amphiphilic surfactants. Therefore, a chemical route can be used to control the morphology, adjust the structure, and further functionalize the surface. I will introduce a phenomenon called "structural transformation" for the mesoporous thin-film materials by applying different aging or calcination conditions. I will also present a new mesostructure called "radial structure" for mesoporous silica nanoparticles made by co-condensation of tetraethyl orthosilicate and an organoalkoxysilane.

(2) Lithography-assisted micropatterning: A hierarchical structure is significant for biomimic study and device fabrication. I developed a new method to pattern mesoporous thin films by depositing a surfactant-templated silica or titania precursor solution onto lithography-designed substrates. Furthermore, this technique allows us to control the orientation of the mesopores at any desired location on the substrates.

(3) Applications: As a material scientist, the ultimate goal is to use the synthesized materials for a specific application. Here I will introduce the biomedical and energy applications by using the synthesized mesoporous materials. For example, perpendicular mesoporous platinum films can be replicated from mesoporous titania thin films and be used as an efficient electrode for fuel cells. In addition, we demonstrate that mesoporous silica nanoparticles (MSN) can be used in intracellular drug delivery with a controllable release rate. For energy application, we have designed multi-functionalized MSNs as efficient catalysts for lignocellulosic biomass conversion.

BIOGRAPHY

Kevin Chia-Wen Wu was born in Taiwan in Feb. 8, 1976. Dr. Wu got his Bachelor degree in 1998 and Master degree in 2000 at the Department of Agriculture Chemistry, National Taiwan University, Taiwan. After that, he studied his Ph.D. course at the Department of Materials Science and Engineering, The University of Tokyo, Japan, and got the Ph.D. degree in 2005. Dr. Wu's major was mesoporous materials, materials chemistry, and lithography.

After he finished his PhD, he joined Prof. Kuroda's group at the Department of Applied Chemistry, Waseda University, Japan as a post-doc from April 2005 to Aug. 2006. From Sep. 2006 to Jul. 2008, he did the second post-doc job with Prof. Victor Lin at the Department of Chemistry, Iowa State University and DOE Ames National Laboratory, U.S. Since Aug. 2008, he joined the Department of Chemical Engineering, National Taiwan University, Taiwan as an Assistant Professor. His current interests include the design and synthesis of multi-functional mesoporous nanoparticles and thin films for biomedical and energy applications by using sol-gel processes, surfactant-templating chemistry, and lithographical technology.

Prof. Wu is a member of the Chemical Society Located in Taipei, Taiwan Institute of Chemical Engineering, American Chemical Society, The Chemical Society in Japan, and The Ceramics Society in Japan. He was a Taiwan-Japan Interchange Association Scholarship Recipient from 2001 to 2005. He also got the Best Speech Award at the 19th Ceramic Research Conference of Kanto Branch, 2003.

*Session : **D1-W3-T3: Nanotechnology***

Towards Cost-effective Encapsulation Architectures and Barrier Layers for Organic Electronic Devices

Jimmy Granstrom, PhD (葛蘭斯重 博士)

Post-doctoral fellow, The George W. Woodruff School Of Mechanical Engineering
Georgia Institute of Technology
Atlanta, GA 30322, USA
Tel: +1-404-385-6728, Fax: +1-404.894.8496
Email: jimmy.granstrom@me.gatech.edu

ABSTRACT

As flexible organic electronic devices become more realistic as a consumer device, the need for low-cost, high performance encapsulations has risen sharply. The organic active components of organic light-emitting diodes (OLEDs) and organic photovoltaic (OPV) devices readily deteriorate with minimal exposure to the atmosphere, resulting in the rapid degradation of device performance. The air sensitivity of organic electronic devices has delayed the broad commercialization of the printed "plastic" electronics technology. The vacuum deposition methods used to fabricate multi-layers which fulfill the encapsulation requirements for plastic electronic devices are complex and expensive. Fully printed "plastic" electronics requires the development of encapsulation architectures which comprise solution deposited barriers, e.g. UV-curable polymers, and/or low-cost free-standing barrier films based on polymers, e.g. poly ethylene terephthalate (PET).

The realization of cost-effective packaging solutions requires the development of both optimized barrier materials and innovative encapsulation architectures. The perfluorinated polymer Cytop™ has been identified as a candidate for one of the layers in a printable polymer/inorganic multilayer encapsulation [1]. Instability suppression, using a high viscosity co-solvent, has been used to improve the barrier performance for thin (< 200 nm) Cytop™ layers [2]. However, the permeability of these barrier layers is still several orders of magnitude higher than the encapsulation requirements for OLEDs and OPVs, thus, the use of Cytop™ in a packaging solution for OLEDs and OPVs requires additional barrier layers for satisfactory encapsulation performance. An architecture comprising nitrogen gas-phase spacers between free-standing barrier films has recently been demonstrated [3], with water vapor transmission rates as low as $2.1*10^{-4}$ g/(m^2, day) utilizing low-cost materials in a Russian Doll structure with epoxy seals separated by nitrogen spacers [4]. This water vapor transmission rate correlates to predicted lifetimes of at least 10 years for inverted OPV modules fabricated and tested by Konarka Technologies (Lowell, MA, USA).

In this talk, I will discuss challenges for barrier layers deposited by vacuum techniques [5], solution deposition [6] and encapsulation architectures comprising nitrogen spacers in order to fulfill the packaging requirements with regards to barrier-, optical- and mechanical properties for encapsulation of organic electronic devices [7].

References

1. J. Granstrom, J. S. Swensen, J. S. Moon, G. Rowell, J. Yuen, A. J. Heeger, Appl. Phys. Lett., 93, 193304 (2008)
2. J. Granstrom, A. Roy, J. S. Moon, G. Rowell, E. Jerkunica, A. J. Heeger, Thin Solid Films, 518, 3767 (2010)
3. J. Granstrom, M. Villet, T. Chatterjee, J. A. Gerbec, E. Jerkunica, A Roy, Appl. Phys. Lett., 95, 093306 (2009)
4. J. Granstrom, M. Gällstedt, M. Villet, J. Moon, T. Chatterjee, Thin Solid Films, In press
5. N. Kim, W. J. Potscavage, B. Domercq, B. Kippelen, S. Graham, Appl. Phys. Lett., 94, 163308 (2009)
6. J. A. Gerbec, J. Granstrom, H. Nulwala, M. Furukawa, C. J. Hawker, L. Campos, Mater. Res. Soc. Proc., 1195-B08-26 (2010)
7. J. Granstrom, M. Gallstedt, O. Arias, T. Chatterjee, S.-W. Cho, T. Blomfeldt, H. Kim, Y. Kim, M. Hedenqvist, S. Graham, Manuscript in preparation for Thin Solid Films

BIOGRAPHY

Jimmy Granstrom was born in Stockholm, Sweden on June 19 1979. He earned his M. Sc. in chemical engineering (major: polymer technology) at Kungliga Tekniska Högskolan (Royal Institute of Technology) in Stockholm, Sweden in December 2004, and his Ph. D in materials science at the University of California Santa Barbara (UCSB) in March 2010 under the supervision of Prof. Alan J. Heeger (Nobel Laureate in Chemistry in 2000).

He worked as a research contractor at Bell Laboratories (supervisors: Howard Katz and Elsa Reichmanis) in Murray Hill, New Jersey, between November 2003 to June 2005. At Bell Labs, Jimmy made significant contributions to the development of the first fiber transistor and the first oscillator circuit produced with mass printing technologies (in collaboration with BASF and Chemnitz Printing Institute in Germany). This work resulted in co-inventorship on two U.S patents ("Fibers with polymeric coatings and making of the same", U.S. Patent # 20050227059 and "Liquid phase fabrication of active devices including organic semiconductors", U.S. Patent # 20070077681). At UCSB, he co-developed an instability suppression approach for solution-deposited barrier layers and published the first paper on encapsulation architectures comprising nitrogen spacers (Appl. Phys. Lett., 95, 093306 (2009)). He is currently a post-doctoral fellow under the supervision of Prof. Samuel Graham at The George W. Woodruff School of Mechanical Engineering at Georgia Institute of Technology in Atlanta, GA. His interests include encapsulation technologies and solution deposition methods for the active layers of organic electronic devices.

Dr. Granstrom is a member of the Materials Research Society (MRS) and the American Physical Society (APS). His work has been published in J. Mater. Res. (2004, 19, 3540), Organic Electronics (2007, 8, 480), Chem. Mater (2007, 19, 4676), Appl. Phys. Lett. (2008, 93, 193304) and Thin Solid Films (518, 3767 (2010)). He was awarded with a fellowship from Crown Princess Victoria of Sweden during the Sweden-America Foundation Annual Meeting in Stockholm in April 2008. He received travel support from the International Center for Materials Research (ICMR) and the Mitsubishi Chemical Center for Advanced Materials (MC-CAM) to visit Mitsubishi Chemical Research Center (MCRC) in Yokohama, Japan in November 2009. He was also awarded with a travel fellowship from the Materials Research Laboratory (MRL) at UCSB to visit Umeå University (Sweden) in December 2009 and the Royal Institute of Technology in Stockholm, Sweden in January 2010. The attached picture was taken during a visit to Copenhagen, Denmark in May 2009, where he gave presentations at the Nordic Polymer Days conference.

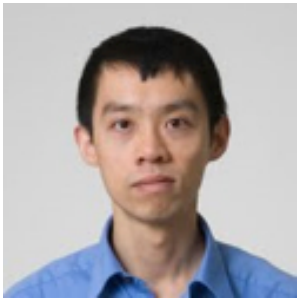
Session : D1-W4-T3: Wireless System

Session Organizer & Chair

Yung-Hsiang Lu, PhD (陸永祥 教授)

Associate Professor, Electrical and Computer Engineering, Purdue University
465 Northwestern Avenue, EE Building, West Lafayette, Indiana 47907-2035, USA
Tel: +1-765-494-2668, Fax: +1-765-494-3371
Email: yunglu@purdue.edu

BIOGRAPHY



Yung-Hsiang Lu (陸永祥) received BSEE from National Taiwan University, Taipei, Taiwan, MSEE from Stanford University, California, USA, and Ph.D. from Stanford University, California, USA. He joined Purdue University in 2002 as an assistant professor and was promoted to an associate professor in 2008.

He was an intern researcher at SGI, IBM, and Compaq in 1996, 1998, and 2000 respectively. He has published 18 journal or magazine articles and more than 50 referred conference papers. Representative publications are

- Karthik Kumar and Yung-Hsiang Lu, "Cloud Computing for Mobile Users: Can Offloading Computation Save Energy?", IEEE Computer, 43(4), April 2010, pages 51-56.
- Nathaniel Pettis and Yung-Hsiang Lu, "A Homogeneous Architecture for Power Policy Integration in Operating Systems", IEEE Transactions on Computers, 58(7), July 2009, pages 945-955.
- Douglas Herbert, Vinaitheerthan Sundaram, Yung-Hsiang Lu, Saurabh Bagchi , and Zhiyuan Li, "Adaptive Correctness Monitoring for Wireless Sensor Networks Using Hierarchical Distributed Run-Time Invariant Checking", ACM Transactions on Autonomous and Adaptive Systems, 2(3), September 2007, Article No. 8, 23 pages.

His research focuses on energy conservation and resource management in computer systems, embedded systems, and mobile robots.

Dr. Lu received a Career Award from the National Science Foundation in 2004 and the Purdue Class 1922 Helping Student Learn Award in 2008. He is an associate editor of ACM Transactions on Embedded Computing Systems since 2008. Dr. Lu is a senior member of the IEEE and the ACM.

Session : D1-W4-T3: Wireless System

Mobile and Cloud Computing -- Opportunities and Challenges

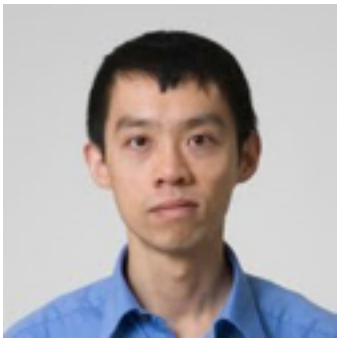
Yung-Hsiang Lu, PhD (陸永祥 教授)

Associate Professor, Electrical and Computer Engineering, Purdue University
465 Northwestern Avenue, EE Building, West Lafayette, Indiana 47907-2035, USA
Tel: +1-765-494-2668, Fax: +1-765-494-3371
Email: yunglu@purdue.edu

ABSTRACT

Mobile systems have become the primary computing platforms for many users, in applications ranging from web surfing, communication, to multimedia. Meanwhile, cloud computing provides the opportunity to fundamentally change the way in which information is accessed, stored, and delivered. Cloud computing enables users to obtain high performance, large storage, and scalable service, without significant initial investment in hardware or software. This seminar explores how this emerging trend of cloud computing will impact the users of mobile systems. I will first explain the conditions to use computation offloading for extending the battery lifetimes of mobile systems. The conditions consider the amounts of computation, the quantities of data transferred between mobile systems and the cloud, as well as the available bandwidths. I will describe a few issues that may prevent mobile cloud computing from becoming reality; these issues include privacy, reliability, and real-time data. Some potential solutions will be presented as the focuses of future research.

BIOGRAPHY



Yung-Hsiang Lu (陸永祥) received BSEE from National Taiwan University, Taipei, Taiwan, MSEE from Stanford University, California, USA, and Ph.D. from Stanford University, California, USA. He joined Purdue University in 2002 as an assistant professor and was promoted to an associate professor in 2008.

He was an intern researcher at SGI, IBM, and Compaq in 1996, 1998, and 2000 respectively. He has published 18 journal or magazine articles and more than 50 referred conference papers. Representative publications are

- Karthik Kumar and Yung-Hsiang Lu, "Cloud Computing for Mobile Users: Can Offloading Computation Save Energy?", IEEE Computer, 43(4), April 2010, pages 51-56.

- Nathaniel Pettis and Yung-Hsiang Lu, "A Homogeneous Architecture for Power Policy Integration in Operating Systems", IEEE Transactions on Computers, 58(7), July 2009, pages 945-955.
- Douglas Herbert, Vinaitheerthan Sundaram, Yung-Hsiang Lu, Saurabh Bagchi , and Zhiyuan Li, "Adaptive Correctness Monitoring for Wireless Sensor Networks Using Hierarchical Distributed Run-Time Invariant Checking", ACM Transactions on Autonomous and Adaptive Systems, 2(3), September 2007, Article No. 8, 23 pages.

His research focuses on energy conservation and resource management in computer systems, embedded systems, and mobile robots.

Dr. Lu received a Career Award from the National Science Foundation in 2004 and the Purdue Class 1922 Helping Student Learn Award in 2008. He is an associate editor of ACM Transactions on Embedded Computing Systems since 2008. Dr. Lu is a senior member of the IEEE and the ACM.

Session : D1-W4-T3: Wireless System

Beyond 3G™. Unlimited Capacity

James Larsen, PhD, CEO & Chairman IWICS, Inc. (拉森 執行長)

19125 North Creek Parkway, Suite 120
Bothell, WA 98011 USA
Tel: +1 425.485.9928
Fax: +1 425.949.3092
Email: james.larsen@iwics.com, URL: http://www.iwics.com/

ABSTRACT

This paper introduces ODMA. ODMA is a subscriber relay network technology that addresses the primary "last-mile" problems in telecom deployments: Coverage, Cost, and Capacity. ODMA takes advantage of advances in complementary technology used to deploy wireless communication services such as advanced modems, host processors, and transmitters. ODMA has high synergy with technologies such as WiMAX, 802.11a/b/g, and MIMO.

An ODMA system requires far less infrastructure investment than conventional wireless communication methods. IWICS' ODMA technology enables each user to become a part of the communication network infrastructure. An ODMA system's deployment cost can be dramatically reduced by the use of unlicensed spectrum to effect transmission between network units. The low investment and operational cost basis of an ODMA network enables Service Providers to provide a highly competitive yet simple wireless services offering for home, business and mobility solutions.

Innovative ODMA technology will enable operators of mobile wireless data networks to provide mass-market access to the Internet at speeds previously available only over broadband connections such as DSL and cable. IWICS' ODMA system will enable true end-to-end Internet Provider connectivity and the lowest cost per megabyte of data delivered. IWICS' ODMA - *Beyond 3G™*.

Key areas addressed in this paper are:

- SoC (System-on-a-Chip), C4I (Content, Computer, Communications, Consumer Electronics, and Integration)
- *Intelligent Infrastructure, Smart Sensing, Emergency Preparedness, Sustainability*

BIOGRAPHY

James Larsen, CEO & Chairman

James Larsen founded IWICS in 2001 utilizing his 25 years of experience in leading teams in the research, development and implementation of intelligent adaptive wireless packet switched relay systems. These multi-hop full mesh networks were applied to a wide range of wireless networks ranging from satellite systems to vehicle telematics throughout the world. Systems researched, designed and developed by James have been successfully manufactured and deployed in a number of multimillion dollar packet switched projects worldwide. James played a key role in the specification, negotiation and deployment of these projects.

James has played the lead role in the development of the IWICS international patent portfolio and is actively involved with the filing of new and innovative patents throughout the world. Before establishing IWICS, James served as President & Chairman of Salbu Research and Development where he lead a team in the primary research and development of a cellular relay system concept to enhance the performance and capacity of future cellular/wireless systems and developed demonstrable hardware and software to implement the concept.

James worked extensively within the worldwide standards bodies to help define the international 3G standards. He has also done extensive work modeling current and future network traffic models, mobility models, propagation models, and evaluation of the models against performance requirements.

James earned a BSEE (Communications, RF and microwave systems, analog integrated circut design) at the University of Natal, South Africa from 1980 to 1984. He has completed substantial experimental and theoretical work toward a PhD in advanced adaptive "Burst mode" packet switch systems and antenna design. James has a total of 12 inventions in the field of adaptive packet switched systems, with 142 patents being granted or accepted, covering nearly 50 countries.

Session : D1-W4-T3: Wireless System

The Wireless Noiseless Handset

Zye-Kong Cheng (鄭志剛 先生)

System Architect , iCHIPdesign International Inc.
1681 Firman Drive, Suite 103
Richardson, TX 75081, USA.
+1-214-2269256
Email: zkc@iCHIPdesign.com, zkc500@gmail.com

ABSTRACT

This presentation introduces 3G phone noiseless handset. We have developed a new kind of telephone handset with acoustic noise cancellation feature. This *noiseless handset* is based on low computational complexity cost and good performance adaptive filter, working with a double microphone system and implemented with a low cost DSP system.

Many telephone conversations are annoyed by background environment noise. In place like railway station, airport, factory this is a real problem. The traditional approach to acoustic noise reduction uses enclosures, barriers, and silencer to attenuate the undesired noise. These silencers are relatively large, costly and ineffective at low frequencies. Digital Signal Processing approach is becoming increasingly popular in telephony application, thanks to availability of low cost and low power consumption DSP. Our DSP based *noiseless handset* improve the conversation quality removing background noise.

BIOGRAPHY

ZK Cheng, System Architect iCHIPdesign International Inc. Over the 25 years of telecom experiences of system engineering skills. Feasibility Analysis, technical strategic planning, generation and maintenance of business and technical/software requirements, design, development & testing including disaster recovery plan. Product delivered to customer and put in services for multiple companies.

ZK Cheng has been a Ph.D Engineering Management program at Walden University. ZK also hold a master degree on computer science in University of North Texas.

Results-driven technical professional with strong record of outstanding achievements in establishing the business and technical requirements, technical planning, business case, network design & development with testing and operational support systems including Operations Administrations, Maintenance & Procedures to ensure service quality assurance/management functions in order to meet company and customer needs. ZK Cheng hold five USPTO patents and many papers and architecture awards.

Session : D1-W1-T4: New Energy, Environment and Sustainability

Session Organizer & Chair

Kan-Lin Hsueh, PhD (薛康琳 教授)

Associate Professor, Department of Energy and Engineering, National United University
#1 Lien-Da Rd., Kung-Ching Li, Miaoli, 36003, Taiwan
Tel: +886-37-381397, Fax: +886-37-381237
Email: KanLinHsueh@hotmail.com

BIOGRAPHY

Kan-Lin Hsueh was born at KeeLung, Taiwan in 1956. He graduated from Chung-Yuan Christian University (Taiwan) in 1977. He received Ph.D. from Clarkson University (USA) in 1984. Graduated works were in the area of fuel cell and energy storage battery. After graduated, he joined the Chem. Eng. Dept., National Tsing Hua University (Taiwan) as associate professor. Research projects were mainly in the area of II-VI semi-conducting material for optical fiber. In 1989, he moved to US and joined AMP Inc. as a member of technical staff. In AMP Inc., he carried out research in the area of high-speed selective plating. Between 1999 and 2001, he studied the electrochemical etching of silicon micro-channel plate in NanoSciences Corp. In 2001, he joined ITRI (industrial Technology Research Institute) Taiwan, conducting research on DMFC (direct methanol, fuel cell) for portable devices and PEMFC (proton exchange membrane fuel cell) for stationary applications. He also served as the manager of PEMFC lab. Since 2008, he joined the Dept. of Energy and Resources, National United University. He started research in the area of fuel cell for energy conversion and battery for energy storage.

Session : ***D1-W1-T4: New Energy, Environment and Sustainability***

From Renewable Energy to Energy Saving: Fluid and Thermal Aspect

Shih-Hsiung Chen, PhD (陳世雄 教授**)**

Associate Professor, Electrical and Computer Engineering, Purdue University
465 Northwestern Avenue, EE Building, West Lafayette, Indiana 47907-2035, USA
Tel: +1-765-494-2668, Fax: +1-765-494-3371
Email: yunglu@purdue.edu

ABSTRACT

...

BIOGRAPHY

...

Session : D1-W1-T4: New Energy, Environment and Sustainability

American Power Act to World Power Practice: A Giant Paradigm Shift toward a Carbon Economy

Truman G. Blocker III, PhD, R&D Director, GhG SaviorTech Corp. (布拉克 博士)

GhG SaviorTech Corp.
1681 Firman Dr. Suite 103
Richardson, TX 75081
Tel: +1-214-755-6559, Fax: +1-972-301-9980
Email: tblocker3@GhGSaviorTech.com

ABSTRACT

The mission of GhG SaviorTech Corp. (GhG) is to convert The Inconvenient Truth into a *Convenient Business* was presented by GhG Founder Peter C. Mei at the 2009 EITC Conference, advocating creation of worldwide opportunities for many decades to come.

GhG SaviorTech has established the ICCI (International Carbon CleanTech Institute) together with the startup of the Garland Power&Light (GP&L) pilot demonstraton plant using a partial Solvay process without recycling ammonia. (In the meantime, Senators John Kerry and Joe Lieberman introduced the American Power Act to start the wheels rolling.)

The first year profit from the GhG/GP&L pilot demonstration plant will be invested into ICCI to develop a series of innovative products that will have worldwide impact, turning the focus from Carbon Capture for Storage (CCS) to Carbon Capture for Products (CCP). Details will be presented at the Conference.

BIOGRAPHY

Truman G. Blocker III, PhD -- R&D Director, GhG SaviorTech Corporation

Dr. Blocker received his bachelors degrees in Pure Mathematics and Physics at the University of Texas, Austin and his M.S. and Ph.D. in Physics, University of Pennsylvania, under Alan J. Heeger, the 2000 Nobel Laureate in Chemistry. His career includes 17 years at Texas Instruments (he is co-holder of patents for the FAA's Air Traffic Control Radar installed at major airports worldwide.) Blocker served in

various technical/management roles including Manager of the VLSI Technology Laboratory, demonstrating 0.1 micron feature size transistor structures in the early 1970s. In the 1980s and 1990s, he served as Director of Corporate Relations for the National Nanofabrication Facility at Cornell University and Director of Research Implementation at the Semicondutor Research Corporation.

Session : D1-W3-T4: Nanotechnology

Session Organizer & Chair

Kuo-Lun Allan Tung, PhD (童國倫 教授)

Director/Professor, R&D Center for Membrane Technology/Department of Chemical Engineering,
Chung Yuan University
#200, Chung-Pei Road, Chungli, Taoyuan 320, Taiwan
Tel: +886-3-2654190, Fax: +886-3-2654198
Email: kuolun@cycu.edu.tw

BIOGRAPHY

Allan Tung was born in 1968 in Taipei, Taiwan. He received the B.S., M.S. and Ph.D. degrees in 1991, 1994 and 1998, respectively, from the National Taiwan University, all in chemical engineering. After post-doctoral research work for one year at National Taiwan University, he joined Chung Yuan University in 1999, where he is currently a Full Professor in the department of chemical engineering. He is one of the founding members of the CMT since 2000 and was elected to serve as deputy director and director in 2006 and 2009, respectively. The CMT is aimed at promoting the development of membrane technology, excelling academic exchange and enhancing cooperation with the industrial sector.

He is now the Director of the R&D Centre for Membrane Technology (CMT) at Chung Yuan University in Taipei, Taiwan with a specialty of research and development on membrane filtration applications for 19 years. With a solid training background of filtration theory since 1990, Allan Tung has been doing research in the area of membrane filtrations for more than 18 years with a strong research interest in the fundamental study of membrane fouling and applications on downstream processing for bioseparation and water/wastewater treatments using experimental and computational methods. Recent research topics include fundamental researches of membrane fouling and filtration mechanism of deformable particle, CFD analysis of fluid flow through textile filter media and porous membranes, molecular dynamic study of transport phenomena in membranes, computer simulation of multi-phase flow and membrane module design for water/wastewater treatments. Some of the developed patented technologies, say feed spacer design technology for spiral wound membrane module, have been transfer to industries.

Prof. Kuo-Lun Allan Tung is also active in the international affairs in membrane filtration discipline. He is now a council member of The Filtration Society in UK and also serving as the managing committee

member of the membrane technology and water reuse specialist groups in international water association (IWA), Taiwan representative Secretary of Asia Pacific Desalination Association (APDA), Taiwan deputy representative of Taiwan, International Delegates on Filtration (INDEFI), and executive committee member of International Recycling Society (IRS).

Session : D1-W3-T4: Nanotechnology

A Novel Computational Approach to Identify the Binding Modes of Various Dyes towards Different Protofibrils Associated with Neurodegenerative Disorders and Virtual Screening

Hsuan-Liang (Kevin) Liu, PhD (劉宣良 所長)

Distinguished professor, Department of Chemical Engineering and Biotechnology
National Taipei University of Technology, Taipei 10608 Taiwan
Tel: +886-2-27712171-2542, Fax: +886-2-27317117
Email: f10894@ntut.edu.tw

ABSTRACT

Thioflavin T and Congo red have been commonly used to identify amyloid fibrils in tissues. Their derivatives, such as [^{11}C]PIB, [^{11}C]SB-13, [^{18}F]FDDNP, have been developed as positron emission tomography (PET) tracers to detect and visualize senile plaques (SPs) and neurofibrillary tangles (NFTs), the hallmark pathologies accompanying the neurodegeneration involved in Alzheimer's disease (AD). It is obvious that understanding the binding modes of various dyes towards protofibrils in a molecular level is essential for the design of better dyes for clinical purposes. However, the specificity and the stabilities of these binding modes and their roles in amyloid fibril detection remain elusive. The lack of high-resolution models further complicates the investigation of these binding modes. In this study, a novel computational approach combining molecular docking, molecular dynamics simulations, and binding free energy calculation using MM/PBSA (molecular mechanics Poisson-Boltzmann surface area) has been developed to investigate: (i) the binding modes of Congo red towards a protofibril formed by an amyloidogenic fragment (GNNQQNY) from the yeast prion protein Sup35 and (ii) the binding modes of Thioflavin T and its neutral analog BTA-1 towards A$\beta_{9\text{-}40}$ protofibrils. Our results, consistent with previous experimental data, provide molecular insights into the nature of the binding modes of these dyes towards amyloid protofibrils. Based on the identification of these binding modes, pharmacophore- and structure-based virtual screening were further performed to identify new binding ligands, which may serve as a target for developing new dyes in clinical applications.

BIOGRAPHY

Prof. Hsuan-Liang (Kevin) Liu was born in Keelung, Taiwan on Nov. 13, 1969. He received his B.S. and Ph.D degree in the field of Chemical Engineering in 1991 and 1998 from National Taiwan University and

Iowa State University, respectively. Prof. Liu's research fields are computational biology, bioinformatics, proteomics, and genetic & protein engineering.

He has been working in the Department of Chemical Engineering and Biotechnology of National Taipei University of Technology (NTUT) for eleven years. He was promoted as a distinguished professor in August 2008 due to his outstanding academic performance. He has received three and two times of the Outstanding Research Awards from the College of Engineering of NTUT and NTUT, respectively. He joined the member of the Taiwan Institute of Chemical Engineering and received the Young Research Fellow Award in 2004. To date, he has published around 100 SCI papers with high quality, including those in Proteomics, Bioinformatics, Current Protein & Peptide Science, Chemical Physics Letters, Biotechnology Progress, Chemical Engineering Journal, etc. His current research interests include molecular dynamics simulations, molecular docking, pharmacophore-based and structure-based virtual screening, and computer-aided drug design.

Prof. Liu is currently a member of the American Chemical Society, the Taiwan Institute of Chemical Engineering, and the Taiwanese Chemical Society. He is also the chair of the Graduate Institute of Biotechnology of NTUT. By continuous devoting his effort in the academic society, Prof. Liu has received high reputation in his country.

Session : D1-W3-T4: Nanotechnology

Nanopore Characterization Techniques-Status Quo and Future Development

Kuo-Lun Allan Tung, PhD (童國倫 教授)

Director/Professor, R&D Center for Membrane Technology/Department of Chemical Engineering,
Chung Yuan University
#200, Chung-Pei Road, Chungli, Taoyuan 320, Taiwan
Tel: +886-3-2654190, Fax: +886-3-2654198
Email: kuolun@cycu.edu.tw

ABSTRACT

A survey of pore size, pore size distribution and morphology characterization techniques for filtration membranes will be presented. Most of the current available techniques can provide "bulk" pore properties in the filtration membranes only and could not provide "depth" profile of the pore properties and/or three-dimensional pore structure in the multilayer filtration membranes. The presentation will be divided into two parts: in the first part, a brief review of the current methods for characterizing filtration membrane pore properties with pore size ranging in several tenth nanometer regions will be given; in the second part, some innovative methods can give "depth profile" properties of pore and free volume in filtration membranes from micron-scale to angstrom will be introduced. Two of those innovative methods, nano-transmission x-ray microscope (NTXM) and position annihilation lifetime spectroscopic (PALS) techniques will be illustrated thoroughly with examples of microfiltration and nanofiltration membranes.

BIOGRAPHY

Allan Tung was born in 1968 in Taipei, Taiwan. He received the B.S., M.S. and Ph.D. degrees in 1991, 1994 and 1998, respectively, from the National Taiwan University, all in chemical engineering. After post-doctoral research work for one year at National Taiwan University, he joined Chung Yuan University in 1999, where he is currently a Full Professor in the department of chemical engineering. He is one of the founding members of the CMT since 2000 and was elected to serve as deputy director and director in 2006 and 2009, respectively. The CMT is aimed at promoting the development of membrane technology, excelling academic exchange and enhancing cooperation with the industrial sector.

He is now the Director of the R&D Centre for Membrane Technology (CMT) at Chung Yuan University in Taipei, Taiwan with a specialty of research and development on membrane filtration applications for 19 years. With a solid training background of filtration theory since 1990, Allan Tung has been doing research in the area of membrane filtrations for more than 18 years with a strong research interest in the fundamental study of membrane fouling and applications on downstream processing for bioseparation and water/wastewater treatments using experimental and computational methods. Recent research topics include fundamental researches of membrane fouling and filtration mechanism of deformable particle, CFD analysis of fluid flow through textile filter media and porous membranes, molecular dynamic study of transport phenomena in membranes, computer simulation of multi-phase flow and membrane module design for water/wastewater treatments. Some of the developed patented technologies, say feed spacer design technology for spiral wound membrane module, have been transfer to industries.

Prof. Kuo-Lun Allan Tung is also active in the international affairs in membrane filtration discipline. He is now a council member of The Filtration Society in UK and also serving as the managing committee member of the membrane technology and water reuse specialist groups in international water association (IWA), Taiwan representative Secretary of Asia Pacific Desalination Association (APDA), Taiwan deputy representative of Taiwan, International Delegates on Filtration (INDEFI), and executive committee member of International Recycling Society (IRS).

Session : D1-W3-T4: Nanotechnology

Engineering Microsystems to Guide Cell Behaviors

Chia-Chi Ho, PhD (何嘉琪 教授)

Associate Professor, University of Cincinnati
497 Rhodes Hall, Cincinnati, OH 45221 USA
Tel: 513 556-2438, Fax: +513-556-2731
Email: chiachiho1@gmail.com

ABSTRACT

Microfabrication techniques are widely used in the electronic industry to generate small features with size between 1-100 μm. This size range is on the same order of a single cell, thus, these microsystems are well suited for studying cell behaviors. Cells in the environment are in contact with the culture solution and extracellular matrix. They sense the signals in the environment and activate signal transudation pathways to alter their behavior. This talk will demonstrate some examples of using micropatterned surfaces and microfluidic systems to control local environment around the cell. Micropatterned surfaces were used to control the cell size and shape. Endothelial cells patterned within the 20 μm grooves formed capillary tube-like structure containing a central lumen. Capillary networks embedded in other tissue specific cell types can be formed on the biomaterials for creating vascularized tissue. Patterned biomaterials can be applied to guide neurons to extend axon and neurite for creating neuronal networks. We have also devised a completely novel microarray-based technique to amplify the natural directional persistence of migrating cells (MANDIP). Using MANDIP, we can amplify this directional persistence to coerce the migration of cells indefinitely along arbitrary paths in one preset direction without chemoattractants, gradients in substrate adhesiveness, or external fields. Potential applications of MANDIP include cell-sorting, drug screening, tissue engineering, wound healing, and mechanistic studies of cell migration, cell-cell interactions, and other cellular processes requiring temporal and spatial regulation. We have devised and are seeking to commercialize a simple *in vitro* migration assay that offers significant improvements in reliability and ease of implementation compared to traditional "wound healing" assays. Instead of mechanically wounding cells, which leads to interferences caused by dead cell debris that block cell movement and molecules released by wounded cells that alter artificially the rate of cell migration, confluent groups of cells, initially confined within patterns of cell-resistant polyelectrolyte, are released by electrostatic adsorption of a second, cell adhesive polyelectrolyte.

BIOGRAPHY

Chia-Chi Ho has a B.S. degree in Chemical Engineering from National Taiwan University (1996), and a Ph.D. degree in Chemical Engineering from University of Delaware (2001). She was a visiting scientist in Harvard University in 2001 working with Prof. George Whitesides and Donald Ingber.

She is currently an Associate Professor in the Chemical and Materials Engineering Department at the University of Cincinnati after being promoted from the Assistant Professor in 2008. Her research interests include membrane separations, membrane design and fabrication, biomaterials, and tissue engineering.

Prof. Ho has been named as Professor of the Quarter by the University of Cincinnati College of Engineering and the Engineering Tribunal, Rising Star by the YWCA, and awarded the 3M nontenured faculty award. Her research has been published in the following: Journal of Membrane Science, Separation Science and Technology, Journal of Colloid and Interface Science, Biotechnology and Bioengineering, Desalination, Journal of Biomedical Materials Research, Macromolecules, Advanced Materials, Langmuir, Biomaterials, Nature Materials, Journal of American Chemical Society, and FASEB Journal.

Session : ***D1-W4-T4: Multimedia System-on-Chip***

Session Organizer & Chair

Jiun-In Guo, PhD (郭峻因 教授**)**

Director / Professor, R&D Center for Membrane Technology / Department of Chemical Engineering,
Chung Yuan University
#200, Chung-Pei Road, Chungli, Taoyuan 320, Taiwan
Tel: +886-3-2654190, Fax: +886-3-2654198
Email: kuolun@cycu.edu.tw

BIOGRAPHY

...

Session : ***D1-W4-T4: Multimedia System-on-Chip***

Low Power Video Technology for Multimedia SoC Design

Jiun-In Guo, PhD (郭峻因 教授**)**

Director / Professor, R&D Center for Membrane Technology / Department of Chemical Engineering,
Chung Yuan University
#200, Chung-Pei Road, Chungli, Taoyuan 320, Taiwan
Tel: +886-3-2654190, Fax: +886-3-2654198
Email: kuolun@cycu.edu.tw

ABSTRACT

...

BIOGRAPHY

...

*Session : **D1-W4-T4: Multimedia System-on-Chip***

Debunking the 100X GPU vs. CPU Myth: An Evaluation of Throughput Computing on CPU and GPU

Yen-Kuang Chen, PhD (陳彥光 博士)

Principal Research Scientist, Intel Corporation
Santa Clara, California, USA
Tel: +1-408-765-8845, Fax: +1-408-653-8511
Email: yen-kuang.chen@intel.com

ABSTRACT

Recent advances in computing have led to an explosion in the amount of data being generated. Processing the ever-growing data in a timely manner has made throughput computing an important aspect for emerging applications. Our analysis of a set of important throughput computing kernels shows that there is an ample amount of parallelism in these kernels which makes them suitable for today's multi-core CPUs and GPUs. In the past few years, there have been many studies claiming GPUs deliver substantial speedups (between 10X and 1000X) over multi-core CPUs on these kernels. To understand where such large performance difference comes from, we perform a rigorous performance analysis and find that after applying optimizations appropriate for both CPUs and GPUs the performance gap between an Nvidia GTX280 processor and the Intel Core i7 960 processor narrows to only 2.5x on average. In this talk, we discuss optimization techniques for both CPU and GPU and architecture features contributed to performance differences between the two architectures.

BIOGRAPHY

Yen-Kuang Chen received the Ph.D. from Princeton University and is a Principal Research Scientist at Intel Corporation. His research interests include developing innovative multimedia applications, analyzing the performance bottleneck in current computers, and designing next generation microprocessor/platform with many cores. In particular, he is analyzing the emerging multimedia applications and providing inputs to the definition of the next-generation CPUs and GPUs with many cores. He has 20+ US patents, 25+ pending patent applications, and 85+ technical publications.

He is an associate editor of the Journal of Signal Processing Systems (including a special issue on "Multi-core Enabled Multimedia Applications & Architectures"), of IEEE Transactions on Circuit and System for Video Technology (including a special issue on "Algorithm/Architectures Co-Exploration of Visual Com-

puting"), of IEEE Transactions on Multimedia, and of IEEE Transactions on Circuit and System I. He is a guest editor of the special issue on "Signal Processing on Platforms with Multiple Cores: Part 1 -- Overview and Methodology" and the special issue on "Signal Processing on Platforms with Multiple Cores: Part 2 -- Design and Applications" for IEEE Signal Processing Magazine. He is a member of Multimedia Signal Processing TC, IEEE Signal Processing Society, Design and Implementation of Signal Processing Systems TC, IEEE Signal Processing Society, Multimedia Systems and Applications TC, IEEE Circuits and Systems Society, and Visual Signal Processing and Communications TC, IEEE Circuits and Systems Society. He has served as a program committee member of 35+ international conferences and workshops.

Currently, he is trying to bring the awareness of the trends and the challenges of many core eras to the development of multimedia applications. In ICME 2007 and 2008, he organized the special sessions on "Multi-Core Enabled Multimedia Applications and Standards" and "Multimedia Signal Processing on Graphics Processors with Hundreds of Cores." In ICME 2009, he organized the workshop on "Multimedia Signal Processing and Novel Parallel Computing." In ICASSP 2008, he gave a tutorial on "Multimedia Signal Processing on Processors with Many Cores." In ICASSP 2009 and ISCAS 2009, he gave a tutorial on "Multimedia Signal Processing on CPUs and GPUs with Many Cores." He is an IEEE Senior Member and an ACM Senior Member.

*Session : **D1-W4-T4: Multimedia System-on-Chip***

Innovation and Commercialization of Microdisplay for 3D Applications

Bor-Yeu Tsaur, PhD (曹伯禹 博士)

Director / Professor, R&D Center for Membrane Technology / Department of Chemical Engineering,
Chung Yuan University
#200, Chung-Pei Road, Chungli, Taoyuan 320, Taiwan
Tel: +886-3-2654190, Fax: +886-3-2654198
Email: kuolun@cycu.edu.tw

ABSTRACT

...

BIOGRAPHY

...

Dinner Keynote Speech (by Invitation)

ECFA: The Economic Cooperation Framework Agreement (兩岸經濟協議)

James Hsin-Hua Wu, PhD (吳新華 博士)

Director, Commercial Division
Taipei Economic & Cultural Office (TECO) in Los Angeles
3660 Wilshire Blvd., Suite 918
Los Angeles, CA 90010
Tel: 213-380-3644
Fax: 213-380-3407
Email: tecola4@pacbell.net

BIOGRAPHY

Work Experience:

Since Feb 2008	Director, Commercial Division, TECO in LA
March 2004-Feb 2008	Deputy Director General, Bureau of Foreign Trade, Ministry of Economic Affairs
June 2000-March 2004	Director, Economic Division, TECRO in Washington DC

Prior to 2000, served in Taiwan's overseas trade offices in Bangkok, Manila, Houston and Copenhagen, and home service with the bilateral trade relations Department of Bureau of Foreign Trade, Ministry of Economic Affairs, ROC

Education Attainment:

Ph. D Economics	University of Santo Tomas, Manila, Philippines (1982)
MBA	San Juan de Letran College of Management, Manila, Philippines
BA Economics	Tunghai University, Taichung, Taiwan, ROC

Session : ***D2-W1-T1: New Energy, Environment and Sustainability***

Session Organizer & Chair

Peter C Mei (梅家駒 執行長)– Founder/CEO

GhG SaviorTech Corp.
1681 Firman Dr. Suite 103, Richardson, Texas 75081, USA
Tel: +1-214-502-6711, Fax: +1-972-591-0731
Email: peter@GhGsaviortech.com

BIOGRAPHY

Peter C. Mei – Chairman/CEO

Mr. Mei was born June 4th, 1955 in Saigon/VN. After finished his high school in Vietnam, he fled out of Saigon by ship and arrived Taiwan in 1972. He earned a BSEE from National Taiwan U. in 1977 and MSEE in Solid State Electronics from Rutgers University in 1983.

During his tenure at TI from '84 to '97, he worked in process control on 0.8-1.2um CMOS fab. 0.8-0.5um Radiation-hardened SOI SRAM development. 0.25, 0.18 and 0.13um CMOS device and isolation technology development for logic DSP. Later, he worked as a member of Technical Staff for TI Corporate R&D on Power Device & Analog/Mix-signal ICs.

Currently, Mr. Mei is Chairman/CEO of 21-Century Silicon, Inc. in Garland, Texas, a silicon material solution company to develop innovative, low-cost Si-material for renewable energy and solar-cell since May'06. President/CEO of iCHIPdesign International, Inc., An innovation materials & technology solutions, Fabless IC "Design+Technology", Before that, he was Exec.VP of Energy Saving Technology Co. and VP, Technical Marketing & Sales(Asia) of GlobiTech Inc. Responsible for develop company's Epitaxy foundry business, Discrete/Power Epi products promotion and value-added IPs. Promoting value-added epitaxy Si material solution, Strained-Si/SiGe, sSOI, GOI and low cost 300mm. As project manager of Infineon International Technology Transfer Management team to transfer 64M/256M DRAM to Taiwan ProMOS startup and harmonization to Infineon Dresden fab., and 0.18/0.13um Core Logic/eDRAM technology to Essonne, France.

Mr. Mei had 25 years of technology R&D, engineering, IC design, and semi & solar material marketing experience. He holds eight patents (6 on LCD HV CMOS devices, 2 on Silicon material) and has published 28 technical papers. He is a Senior Member of IEEE.

Peter and his wife Agnes reside in Plano, Texas since '84, raising two college kids and a ten year old daughter, who keep him from empty nest too soon before he can even thinking of retirement.

*Session : **D2-W1-T1: New Energy, Environment and Sustainability***

Teaching Entrepreneurs How to Build Sustainable Business

Dwight Collins, PhD (柯林斯 博士)

GhG SaviorTech Corp.
1681 Firman Dr. Suite 103, Richardson, Texas 75081, USA
Tel: +1-214-502-6711, Fax: +1-972-591-0731
Email: peter@GhGsaviortech.com

ABSTRACT

...

BIOGRAPHY

...

*Session : **D2-W1-T1: New Energy, Environment and Sustainability***

Green Supply Chain and Intelligent Transportation

Grace Lin, PhD (林蔚君 教授)

GhG SaviorTech Corp.
1681 Firman Dr. Suite 103, Richardson, Texas 75081, USA
Tel: +1-214-502-6711, Fax: +1-972-591-0731
Email: peter@GhGsaviortech.com

ABSTRACT

...

BIOGRAPHY

...

*Session : **D2-W1-T1: New Energy, Environment and Sustainability***

BPM and Sustainable Globally Integrated Enterprise

Ko-Yang Wang, PhD (王可言 博士)

GhG SaviorTech Corp.
1681 Firman Dr. Suite 103, Richardson, Texas 75081, USA
Tel: +1-214-502-6711, Fax: +1-972-591-0731
Email: peter@GhGsaviortech.com

ABSTRACT

...

BIOGRAPHY

...

Session : D2-W3-T1: Nanotechnology

Session Organizer & Chair
Lei L. Kerr, PhD (柯蕾 教授)

Assistant Professor, Dept. of Chemical and Paper Engineering, Miami University
Oxford, Ohio, USA
Tel: +1-513-529-0768, Fax: +1-513-529-0761
Email: kerrll@muohio.edu

BIOGRAPHY

Dr. Lei L. Kerr received her B.S. in Chemical Engineering from Wuhan Institute of Chemical Technology, Wuhan, China in 1997. She received her Ph.D. in Chemical Engineering from University of Florida with Professor Tim Anderson in May, 2004. She joined the faculty of Chemical and Paper Engineering at Miami University Miami University in August, 2004. She was the 2006 summer faculty Fellow at NASA Glenn Research Center in Cleveland, OH.

Session : ***D2-W3-T1: Nanotechnology***

Nano-Structures for Solar Cells

Ching-Fuh Lin, PhD (林清富 教授**)**

Professor, Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering,
National Taiwan University
No. 1, Sec. 4, Roosevelt Road, Taipei, Taiwan
Tel: +886-2-33663540, Fax: +886-2-23642603
Email: cflin@cc.ee.ntu.edu.tw

ABSTRACT

The foreseeable fossil-energy depletion and the global warming caused by the carbon dioxide gives rise to the increasing need of alternative renewable energy, especially photovoltaic (PV). Although crystalline Si-PV devices are quickly spreading, the large consumption of Si materials hinders their vast applications. Therefore, it is very important to develop thin-film PV devices of low cost. In this talk, we will discuss the use of nano-structured semiconductors that enable the fabrication of thin-film solar cells with improved efficiency. Two types of such thin-film solar cells will be discussed, including the semiconductor-oxide sandwiched organic solar cells and semiconductor nanowire solar cells.

In the sandwiched-type organic solar cells, the semiconductor oxides that sandwich the organic active materials are investigated and discussed. We will discuss the conditions and the function of the semiconductor oxides as well as the processing conditions for good interpenetrating nano-morphology of the organic active layer. Special care will be brought up to the solution process for depositing those layers. The solution process promises very low-cost production of organic solar cells in the future.

For the solar cells using semiconductor nanowires, we are exploring the combination of the nanowires with the organic materials to form p-n junction as well as the techniques to transfer those nanowires to alien substrates to lower the material cost.

BIOGRAPHY

Dr. Ching-Fuh Lin obtained the B.S. degree from National Taiwan University in 1983, and the M.S. and Ph.D. degrees from Cornell University, Ithaca, NY, in 1989 and 1993, respectively, all in electrical

engineering. He is now a joint professor in the Graduate Institute of Photonics and Optoelectronics, Graduate Institute of Electronics Engineering, and Department of Electrical Engineering at National Taiwan University. His research interests include organic-inorganic composite thin-film solar cells and optoelectronic devices, Si nanowire solar cells, Si-based photonics, and physics in broadband semiconductor lasers and optical amplifiers.

He is currently a Fellow of IEEE, Fellow of SPIE, Member of Asia-Pacific Academy of Materials, and a member of OSA. He has published about 130 journal papers and more than 300 conference papers and hold over 30 patents. He is also the sole author of a book, Optical Components for Communications: Principles and Applications, published by Kluwer Academic Publishers (USA 2004). He had obtained 5 times of Class A Research Awards and the Distinguished Research Award from National Science Council of Taiwan, ROC, and the Outstanding Electrical Engineering Professor Award from the Chinese Institute of Electrical Engineering. He and his students had also been granted the 18th Acer Research Golden Award, 18th Acer Research Excellent Award, 14th Acer Research Excellent Award, Collins Thesis Awards for years 1998, 2001, 2002, 2004, 2007, and 2009.

Prof. Lin has served as the Chair of IEEE LEOS Chapter Taipei Section, the Board member of the 17th IEEE Taipei Section, the Evaluation Committee member of Higher Education Evaluating & Accreditation Council of Taiwan, the Council member of the 10th Optical Engineering Society of ROC, and the Convener in the area of Electronics and Information for the Conventional Industry Technology Development Project in the Bureau of Industry, Ministry of Economics, ROC. He has also served as Project Instructors of the National Programs in the nano-science and nano- technology and the renewable energy (solar energy).

Session : ***D2-W3-T1: Nanotechnology***

Cobalt Oxide Nanowire Arrays: Synthesis and Energy Applications

Yiying Wu, PhD (吳屹影 教授)

Professor, Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering,
National Taiwan Univserity
No. 1, Sec. 4, Roosevelt Road, Taipei, Taiwan
Tel: +886-2-33663540, Fax: +886-2-23642603
Email: cflin@cc.ee.ntu.edu.tw

ABSTRACT

...

BIOGRAPHY

....

Session : D2-W3-T1: Nanotechnology

Deposition Processes of Thin-Film CIGS-based Solar Cells

Chia-Hua Huang, PhD (黃家華 教授)

Assistant Professor, Department of Electrical Engineering, National Dong Hwa University
No. 1, Sec. 2, University Road, Shou-Feng, Hualien, Taiwan
Tel: +886-3-863-4077, Fax: +886-3-863-4060
Email: chuang@mail.ndhu.edu.tw

ABSTRACT

The typical deposition processes of copper indium gallium diselenide ($CuIn_{1-x}Ga_xSe_2$ or CIGS) films are co-evaporation process and selenization process. So far, the best efficiency thin-film CIGS solar cell employs the co-evaporation method. The co-evaporation system consists of four effusion cells for evaporation of Cu, In, Ga, and Se elemental sources, and EIES (Electron Impact Emission Spectroscopy) for the monitoring and control of the flux rates of four elements during the deposition.

The selenization process for the preparation of CIGS films can be easily scaled up for the mass production of large-area substrates. The slenization process is conducted by using the less toxic Se vapor. The dependence of the selenization conditions such as the Se flow rate, processing temperature, and processing duration on the resulting CIGS films are explored.

BIOGRAPHY

Dr. Chia-Hua Huang received the B.S. degree in the Department of Electrical Engineering from the National Sun Yat-Sen University, Taiwan. Dr. Huang earned the M.S. and Ph.D. degree in the Department of Electrical and Computer Engineering from University of Florida in 1997 and 2002, respectively. Dr. Huang's major research was the thin-film CIGS-based solar cells for his graduate study.

He was a faculty member in the Department of Electrical Engineering of National Chi Nan University from 2002 to 2003. Since August of 2003, he has joined the Department of Electrical Engineering of National Dong Hwa University, Hualien, Taiwan. Since 1995, he has been focusing on the research of thin-film CIGS-based solar cells. His research interests include the thin-film CIGS-based solar cells, dye-sensitized solar cells, and organic solar cells. He has published the scientific papers in the fields of thin-film CIGS-based solar cells, dye-sensitized solar cells, and organic solar cells.

Session : ***D2-W4-T1: System-on-Chip***

Session Organizer & Chair

Wei Hwang, PhD (黃威 教授**)**

Professor, Microelectronics and Information Systems
Research Building, Rm. 307, National Chiao-Tung University
1001 Ta Hsueh Road, Hsinchu, Taiwan 300
Tel: +886-3-572-9541, Fax: +886-3-571-9730
Email: hwang@mail.nctu.edu.tw

BIOGRAPHY

Professor Wei Hwang received the M. Sc and Ph.D. degrees in electrical engineering from the University of Manitoba, Canada in 1970 and 1974, respectively.

From 1975 to 1978, he was Assistant Professor of Electrical Engineering at Concordia University in Montreal., Canada. From 1979 to 1984, he was Associate Professor of Electrical Engineering at Columbia University in New York, NY, USA. From 1984 to 2002, he was a Research Staff Member at the IBM Thomas J. Watson Research Center, Yorktown Heights, NY, USA, where he worked on high performance DRAM and microprocessor design. In 2002, he joined National Chiao Tung University (NCTU) in Hsinchu, Taiwan, where he holds a Chair Professor of Electronics Engineering. During 2002-2008, he served as Director of Microelectronics and Information Systems Research Center. During 2003-2007, he also served as Co-Principal Investigator of National System-on-Chip (NSoC) Program in Taiwan. From 2005 to 2007, he was Vice President and Acting President of NCTU.

He has received several IBM Awards, including sixteen IBM Invention Plateau Invention Achievement Awards, four IBM Research Division Technical Awards, was named an IBM Master Inventor. He has also received the CIEE Outstanding Electrical Engineering Professor Award in 2004 and Outstanding Scholar Award from the Foundation for the advancement of Outstanding Scholarship for 2005 to 2010. Dr. Hwang is the coauthor of the book "Electrical Transports in Solids-with particular reference to organic semiconductors", which has been translated into Russian and Chinese. He has authored or coauthored

over 180 technical papers in renowned international journals and conferences, and holds over 150 international patents (including 65 U.S. patents). He has presented numerous plenary, invited or tutorial papers/talks at international conferences. He has served as the General Chair of 2007 IEEE SoC Conference (SOCC 2007) and the General Chair of 2007 IEEE International Workshop on Memory Technology, Design and Testing (MTDT 2007). He is severing as a Supervisor of IEEE Taipei Section for 2007 to 2010. He is a Life Fellow of IEEE.

*Session : **D2-W4-T1: System-on-Chip***

Memory-Centric On-chip Data Communication Platform for Energy-Efficient Heterogeneous Systems

Wei Hwang, PhD (黃威 教授)

Professor, Microelectronics and Information Systems
Research Building, Rm. 307, National Chiao-Tung University
1001 Ta Hsueh Road, Hsinchu, Taiwan 300
Tel: +886-3-572-9541, Fax: +886-3-571-9730
Email: hwang@mail.nctu.edu.tw

ABSTRACT

....

BIOGRAPHY

Professor Wei Hwang received the M. Sc and Ph.D. degrees in electrical engineering from the University of Manitoba, Canada in 1970 and 1974, respectively.

From 1975 to 1978, he was Assistant Professor of Electrical Engineering at Concordia University in Montreal., Canada. From 1979 to 1984, he was Associate Professor of Electrical Engineering at Columbia University in New York, NY, USA. From 1984 to 2002, he was a Research Staff Member at the IBM Thomas J. Watson Research Center, Yorktown Heights, NY, USA, where he worked on high performance DRAM and microprocessor design. In 2002, he joined National Chiao Tung University (NCTU) in Hsinchu, Taiwan, where he holds a Chair Professor of Electronics Engineering. During 2002-2008, he served as Director of Microelectronics and Information Systems Research Center. During 2003-2007, he also served as Co-Principal Investigator of National System-on-Chip (NSoC) Program in Taiwan. From 2005 to 2007, he was Vice President and Acting President of NCTU.

He has received several IBM Awards, including sixteen IBM Invention Plateau Invention Achievement Awards, four IBM Research Division Technical Awards, was named an IBM Master Inventor. He has also

received the CIEE Outstanding Electrical Engineering Professor Award in 2004 and Outstanding Scholar Award from the Foundation for the advancement of Outstanding Scholarship for 2005 to 2010. Dr. Hwang is the coauthor of the book "Electrical Transports in Solids-with particular reference to organic semiconductors", which has been translated into Russian and Chinese. He has authored or coauthored over 180 technical papers in renowned international journals and conferences, and holds over 150 international patents (including 65 U.S. patents). He has presented numerous plenary, invited or tutorial papers/talks at international conferences. He has served as the General Chair of 2007 IEEE SoC Conference (SOCC 2007) and the General Chair of 2007 IEEE International Workshop on Memory Technology, Design and Testing (MTDT 2007). He is severing as a Supervisor of IEEE Taipei Section for 2007 to 2010. He is a Life Fellow of IEEE.

Session : ***D2-W4-T1: System-on-Chip***

Modularized Board-Level and System-in-Package (SiP) Platforms for Complex System Integration and Prototyping

Chun-Ming Huang, PhD (黃俊銘 組長**)**

National Chip Implementation Center
National Applied Research Laboratories, Taiwan, R.O.C.
Email: cmhuang@cic.org.tw

ABSTRACT

In this talk, we will present two platforms for system integration and prototyping, namely, CONCORD-II and MorPack. CONCORD-II is a fully configurable board-level system prototyping platform, which provides high flexibility in connection interfaces, high flexibility and high architectural compatibility for design changes, and high modularity for specific applications. MorPack is a multi-substrate system-in-package platform, which provides the capability to implement a whole system into a single package. We will show how these two platforms can help system designers to explore and verify complex system architecture before detailed silicon implementation, furthermore, can prototype whole systems with very low cost.

BIOGRAPHY

Chun-Ming Huang received the B.S. degree in mathematical science from National Chengchi University, Taipei, Taiwan, R.O.C., in 1990, and the M.S. and Ph.D. degree, both in computer science, from the National Tsing-Hua University, Hsin-Chu, Taiwan, R.O.C., in 1992 and 2005, respectively. Since 1993, he has been with the National Chip Implementation Center (CIC), where he is currently a researcher and department manager in the Design Service Department (DSD). His research interests include VLSI design and testing, platform-based SOC design methodologies, and multimedia communication. Dr. Huang is a member of Phi Tau Phi Scholastic Honor Society.

Session : ***D2-W4-T1: System-on-Chip***

Constructing Electronic System Level Models Using Simulink

Emerson Ming-Fu Hsiao, PhD (蕭明富 博士)

Professor, Microelectronics and Information Systems
Research Building, Rm. 307, National Chiao-Tung University
1001 Ta Hsueh Road, Hsinchu, Taiwan 300
Tel: +886-3-572-9541, Fax: +886-3-571-9730
Email: hwang@mail.nctu.edu.tw

ABSTRACT

...

BIOGRAPHY

...

Session : ***D2-W1-T2: New Energy, Environment and Sustainability***

Session Organizer & Chair

Ko-Yang Wang, PhD (王可言 博士)

Professor, Microelectronics and Information Systems
Research Building, Rm. 307, National Chiao-Tung University
1001 Ta Hsueh Road, Hsinchu, Taiwan 300
Tel: +886-3-572-9541, Fax: +886-3-571-9730
Email: hwang@mail.nctu.edu.tw

BIOGRAPHY

...

Session : ***D2-W1-T2: New Energy, Environment and Sustainability***

Green Economy: A Socially Responsible and Green Enterprise

Albert Oung, PhD

Professor, Microelectronics and Information Systems
Research Building, Rm. 307, National Chiao-Tung University
1001 Ta Hsueh Road, Hsinchu, Taiwan 300
Tel: +886-3-572-9541, Fax: +886-3-571-9730
Email: hwang@mail.nctu.edu.tw

BIOGRAPHY

...

Session : ***D2-W1-T2: New Energy, Environment and Sustainability***

Venture Opportunities in Energy, Environment, and Sustainability

Matthew Denesuk, PhD (丹思克 博士)

Professor, Microelectronics and Information Systems
Research Building, Rm. 307, National Chiao-Tung University
1001 Ta Hsueh Road, Hsinchu, Taiwan 300
Tel: +886-3-572-9541, Fax: +886-3-571-9730
Email: hwang@mail.nctu.edu.tw

BIOGRAPHY

...

Session : ***D2-W1-T2: New Energy, Environment and Sustainability***

Smart Grid

Erfan Ibrahim, PhD (亞伯拉漢 博士**)**

Professor, Microelectronics and Information Systems
Research Building, Rm. 307, National Chiao-Tung University
1001 Ta Hsueh Road, Hsinchu, Taiwan 300
Tel: +886-3-572-9541, Fax: +886-3-571-9730
Email: hwang@mail.nctu.edu.tw

BIOGRAPHY

...

Session : D2-W3-T2: Nanotechnology

Session Organizer & Chair

Kuan-Jiuh Lin, PhD (林寬鋸 教授)

Professor, Department of Chemistry, National Chung Hsing University, Taichung 402, Taiwan
Tel: +886-4-22870515, Fax: +886-4-22854488
Email: kjlin@dragon.nchu.edu.tw

BIOGRAPHY

Education:

B.S. 1984 – 1988	Department of Chemistry, Tankang University
M.S. 1988 – 1990	Department of Chemistry, National Taiwan University
Ph. D. 1990 – 1993	Department of Chemistry, National Taiwan University

Professional Appointments:

2003 – 2009	Director of Center of Nanoscience and Nanotechnology, National Chung Hsing University
2005/2-	Professor, Department of Chemistry, National Chung Hsing University
2002/2 - 2005/1	Associate Professor, Department of Chemistry, National Chung Hsing University
1999/8 - 2002/1	Assistant Professor, Department of Chemistry, National Chung Hsing University
1993/10 - 1999/7	Post-Doctoral fellowship, Institute of Chemistry, Academia Sinica, Taipei

Honors and Awards:

Academia Sinica Outstanding Research Award 2000
National Science Council Research Award, 1999-2001
Junior Research Faculty Award of National Chung-Hsing University, 2004
Chinese Chemical Association Outstanding Research Award, 2004
National Science Council Wu Da-Yuo Award, 2004
Y. Z. Hsu Outstanding Scientific Paper Award for Nanoscience and Technology, 2005 (Far Easterm Foundation)

Research Interests:

1. Fabrication of plasmonics for bio-chips
2. Fabrication of transparent conductive films
3. Energy-saving materials for LED –lighting, DSSC, and Low-Emissivity Glasses

Selected Publications:

1. Nujiang Tang, Waston Kuo, Chienchung Jeng, Liyuan Wang, **Kuan-Jiuh Lin** and Youwei Du, "Coil-in-Coil Carbon Nanocoils: 11 Gram-Scale Synthesis, Single Nanocoil Electrical Properties, and Electrical Contact Improvement" *ACS Nano*, **2010**, ***4*** (2), 781–788. (Impact factor: 5.472)
2. Nujiang Tang, Jianfeng Wen, Yang Zhang, Fanxin Liu, **Kuan-Jiuh Lin** and Youwei Du, "Helical Carbon Nanotubes: Catalytic Particle Size-Dependent Growth and Magnetic Properties" *ACS Nano*, **2010**, ***4*** (1), 241–250. (Impact factor: 5.472)
3. Wen Yin Lynn Ko, Hitesh G. Bagaria, Subashini Asokan, **Kuan-Jiuh Lin**, and Michael S. Wong, "CdSe Tetrapod Synthesis Using Cetyltrimethylammonium Bromide and Heat Transfer Fluids" *Journal of Materials Chemistry* **(2010) DOI: 10.1039/b922145j** (Impact factor: 4.646)
4. Wei-Hung Chen, Wen-Yin Ko, Ying-Shiou Chen, Ching-Yuan Cheng, Chi-Ming Chan, and **Kuan-Jiuh Lin**, "Growth of Copper Phthalocyanine Rods on Au Plasmon Electrodes through Micelle Disruption Methods" *Langmuir* **(2010)** 26, 2191–2195. (Impact factor: 4.097)
5. Hsu Chuen-Yuan, Huang Jing-Wen, Gwo Shangjr, **Lin Kuan-Jiuh**, "The facile fabrication of tunable plasmonic gold nanostructure arrays using microwave plasma" *Nanotechnology*, **(2010)**, 21(3), 035302/1-035302/6. (Impact factor: 3.446)
6. Su, Jun-Wei, Gwo, Shangjr. **Lin, Kuan-Jiuh**, "Well-aligned multi-walled carbon nanotubes emitting natural white-light under microwave irradiation" *Chemical Communications* **(2009)**, 44, 6777-6779. (Impact factor :5.141)

Session : D2-W3-T2: Nanotechnology

CdS sensitized Nanocrystalline Solid State and Liquid State solar cells

Lei L. Kerr, PhD (柯蕾 教授)

Assistant Professor, Dept. of Chemical and Paper Engineering, Miami University
Oxford, Ohio, USA
Tel: +1-513-529-0768, Fax: +1-513-529-0761
Email: kerrll@muohio.edu

ABSTRACT

The obstacle to realize the large scale production of Dye Sensitized Solar Cells (DSSCs) is its long term stability and reliability problem. One of the main causes to the instability of DSSCs is the use of liquid electrolytes. In addition, exploring quantum dots or nano-sized particles of CdS as an alternative sensitizer for organic dye in dye sensitized solar cells have attracted great interest due to the high cost and the UV instability of the organic dye. Our study has found that the CdS sensitized TiO_2 cell degrades rapidly in the liquid electrolytes even under dark environment. Thus, in this work, a solid state solar cell structure of Glass/FTO/TiO_2/CdS:Cu/Pt/FTO/glass was made. An efficiency of 0.7% was obtained. CdS:Cu served as both the p-type conductor and sensitizer. No efficiency was obtained for cell structures of glass/FTO/TiO_2/CdS/FTO/glass. This indicates the effectiveness of hole conducting behavior of CdS:Cu. This is the first time this type of solid state solar cell is reported. In addition, a 2.46% (V_{oc}=0.69 V, J_{sc}= 6.54 mA/cm^2, F.F. = 0.55) CdS sensitized nanoparticle TiO_2 solar cell is achieved for activation area of 0.16 cm^2 under AM 1.5. This is the highest reported efficiency of using CdS alone as sensitizer (0.16 cm^2 Am 1.5). The control sample of N3 dye sensitized TiO_2 solar cell has efficiency of 7.8%.

BIOGRAPHY

Dr. Lei L. Kerr received her B.S. in Chemical Engineering from Wuhan Institute of Chemical Technology, Wuhan, China in 1997. She received her Ph.D. in Chemical Engineering from University of Florida with Professor Tim Anderson in May, 2004. She joined the faculty of Chemical and Paper Engineering at Miami University Miami University in August, 2004. She was the 2006 summer faculty Fellow at NASA Glenn Research Center in Cleveland, OH.

*Session : **D2-W3-T2: Nanotechnology***

Understanding Atomic Force Microscope High-Field Lithography

Stephanie Vasko, Graduate Student

Department of Chemistry, Department of Materials Science and Engineering
University of Washington, Seattle, WA, 98105, USA
Tel: (206)-685-3851 Fax:
Email: vasko@uw.edu

ABSTRACT

Fabricating Ge on Si integrated structures with nanoscale accuracy is a challenging pursuit essential for novel advances in electronics and photonics. An ideal nanostructure growth process would afford precise control of nanostructure chemistry, size, shape, and placement to completely eliminate any post growth fabrication. This talk will present a novel approach to Ge on Si nanostructures that exploits the tip of an atomic force microscope (AFM) to localize nanostructure growth. In this approach, the biased AFM tip (*ca.* -12 V) locally reacts an organometallic liquid precursor (diphenylgermane) while it traces desired shapes on the sample. This produces high quality carbon-free Ge nanostructures with deterministic placement, size, and composition control. Potential applications include Ge channel transistors and photodetectors.

BIOGRAPHY

[photo]

Stephanie Vasko is a chemistry graduate student at the University of Washington working for Prof. Marco Rolandi in the Department of Materials Science and Engineering. She received her BS (magna cum laude) in Chemistry from Carleton College in 2007 and her MS in chemistry from the University of Washington in 2009. She worked for Prof. Melissa Eblen-Zayas (Dept. of Physics) at Carleton College from 2005-2007 and was an NSF-REU participant at Penn State (Dept. of Physics, 2004) and SUNY Stony Brook's Center for Environmental Molecular Science (2005).

Her research focuses on the deposition and characterization of inorganic nanostructures from precursor liquids via high-field atomic force lithography. She is also working on elucidating the unique chemical reactions that take place at the tip-sample gap during deposition using this technique.

She received an National Science Foundation Integrative Graduate Education Research Traineeship (NSF-IGERT) from 2008-2010, the University of Washington Chemistry Department's West Fellowship from 2007-2008.

*Session : **D2-W3-T2: Nanotechnology***

Nanostructured Energy Applications

Yi Cui, PhD (崔屹 教授)

Department of Materials Science and Engineering
Stanford University
Email: **yicui@stanford.edu**

ABSTRACT
Highly engineered nanomaterials afford the great opportunities for controlling electronic, photonic, mechanical and ionic processes, which are important for energy applications. Here I will present examples on high performance and/or low-cost nanostructured energy applications including transparent electrodes, photovoltaics, batteries, supercapacitors and large-scale energy storage devices.

BIOGRAPHY

[photo]

Yi Cui went to University of Science and Technology of China, where he received a Bachelor's degree in Chemistry in 1998. He attended graduate school from 1998 to 2002 at Harvard University, where he worked under supervision of Professor Charles M. Lieber. His Ph.D thesis concerned semiconductor nanowires for nanotechnology including synthesis, nanoelectroncis and nanosensor applications. After that, he went on to work as a Miller Postdoctoral Fellow with Professor Paul Alivisatos at University of California, Berkeley. His postdoctoral work was mainly on electronics and assembly using colloidal nano-crystals. In 2005 he became an Assistant Professor in Department of Materials Science and Engineering at Stanford University. In 2010 he was promoted to an Associate Professor with tenure. His current research is focused on nanomaterials for energy storage, photovotalics, topological insulators, biology and environment.
He has received the Sloan Research Fellowship (2010), the Global Climate and Energy Project Distinguished Lecturer (2009), KAUST Investigator Award (2008), ONR Young Investigator Award (2008), MDV Innovators Award (2007), Terman Fellowship (2005), the Technology Review World Top Young Innovator Award (2004), Miller Research Fellowship (2003), Distinguished Graduate Student Award in Nanotechnology (Foresight Institute, 2002), Gold Medal of Graduate Student Award (Material Research Society, 2001).

Session : ***D2-W4-T2: Medical System-on-Chip***

Session Organizer & Chair

Liang-Gee Chen, Ph. D (陳良基 副院長**)**

Department of Power Mechanical Engineering, National Tsing Hua University
101, Sec. 2, Kwang Fu Road, Hsinchu 30013, Taiwan
Tel: +886-3-5742591, Fax: +886-3-5722840
Email: cwhong@pme.nthu.edu.tw

BIOGRAPHY

...

Session : D2-W4-T2: Medical System-on-Chip

Smart CMOS Image Sensors for Biomedical Applications

Jun Ohta, PhD (太田淳 教授**)**

Graduate School of Materials Science, Nara Institute of Science and Technology
8916-5 Takayama, Ikoma, Nara 630-0101, JAPAN
Tel: +81-743-72-6051, Fax: +81-743-72-6059
Email: ohta@ms.naist.jp

ABSTRACT

I present recent progress of implantable biomedical devices based on microelectronics technologies developed in our laboratory. First, I will demonstrate retinal prosthesis devices, which are implanted in the retinal and electrically stimulate retinal cells to partially restore vision for blind patient suffered from retinitis pigmentosa (RP) and age-related macular degeneration (AMD). To realize clear vision, over 1000 stimulus points are required. We are developing a retinal prosthesis device with large number of electrodes by introducing microelectronics technologies. We have successfully demonstrated that a microelectronics-based stimulator implanted in a rabbit eye can stimulate the retinal cells. Next, I will show an implantable device into a mouse brain to measure *in vivo* imaging of fluorescence inside a mouse hippocampus in real-time. The device is based on a CMOS image sensor with 176 x 144-pixel integrated with four Pt electrodes on the sensor surface for electrical stimulation and potential sensing of neural cells. The device also employs UV-LEDs to excite fluorescence, which can be detected with the image sensor. We have successfully demonstrated real-time *in vivo* protease imaging inside the mouse hippocampus by injecting kinic acid intraperitoneally to induce epilepsy intentionally, which causes serine protease emitted. In the next stage, we are planning to measure the evolution of brain activities in an untethered mouse..

BIOGRAPHY

Jun Ohta was born in Gifu, Japan in 1958. He received the B.E., M.E., and Dr. Eng. degrees in applied physics, all from the University of Tokyo, Japan, in 1981, 1983, and 1992, respectively.

In 1983, he joined Mitsubishi Electric Corporation, Hyogo, Japan, where he engaged in the research on optoelectronic integrated circuits, optical neural networks, and artificial retina chips. From 1992 to 1993, he was a Visiting Researcher in Optoelectronics Computing Systems Center, University of Colorado at

Boulder, where he engaged in the research on smart CMOS sensors. In 1998, he joined Graduate School of Materials Science, Nara Institute of Science and Technology (NAIST), Nara, Japan as Associate Professor. He was appointed as Professor in 2004. His current research interests are vision chips, CMOS image sensors, retinal prosthesis, biomedical-photonic LSIs, integrated photonic devices. He is an author of *Smart CMOS Image Sensors and Applications*, CRC Press, Boca Raton, FL, 2007, and co-authors of *Artificial Sight*, by M.S. Humayun *et al.* (Eds.), Springer, New York, NY 2007 and *Bio-Medical CMOS ICs* by Hoi-Jun Yoo and Chris van Hoof (Eds.), Springer, New York, NY 2010.

Professor Ohta received the Best Paper Award of the Institute of Electronics, Information, and Communication Engineers (IEICE) Japan in 1992, the Ichimura Award in 1996, the National Commendation for Invention in 2001, Niwa-Takayanagi Award of The Institute of Image Information and Television Engineers (ITE) Japan in 2007, and Izuo Hayashi Award of the Japan Society of Applied Physics (JSAP) in 2009. He is a Councilor of JSAP, an Editorial Committee of ITE and a Chairman of ITE Information Sensing Research Committee, a member of IEICE Japan, IEEE, and OSA. In 2008 to the present, he serves as a Far East Regional Committee and an International Technical Program Committee in Imagers, MEMS, Medical devices, and Displays of IEEE International Solid-State Circuits Conference (ISSCC).

Session : ***D2-W4-T2: Medical System-on-Chip***

CMOS for Biomedical Applications

Luke Theogarajan, PhD (Theogarajan 教授)

Graduate School of Materials Science, Nara Institute of Science and Technology
8916-5 Takayama, Ikoma, Nara 630-0101, JAPAN
Tel: +81-743-72-6051, Fax: +81-743-72-6059
Email: ohta@ms.naist.jp

ABSTRACT

...

BIOGRAPHY

....

Session : D2-W4-T2: Medical System-on-Chip

Design and Implementation of an XML Parsing Engine

Sheng-De Wang, PhD (王勝德 教授)

Professor, Department of Electrical Engineering
National Taiwan University, Taiwan
Tel: +886-2-3366-3579, Fax: +886-2-2363-5800
Email: sdwang@ntu.edu.tw

ABSTRACT

XML (Extensible Markup Language) is a cross-platform markup language. It has been used on lots of most common applications in our computer system because of the extension and user customization features. In order to parse XML documents efficiently, much research has been done to accelerate the processing of XML documents or messages. The hardware-accelerated approach is becoming important due to a higher performance is getting expected. Current hardware platforms for processing XML documents lack the capability of well-formed checking for XML documents because of complication. To improve existing design methods, lower the CPU load and process XML efficiently, we present a hardware accelerated XML parser with well-formed checker by using the abstract classification table. The approach provides a testing and verification platform for XML processing. Abstract classification table is an emerging indexing technique to represent the hierarchical structure of XML documents and can accelerate XML processing. In our platform, the hardware accelerator can parse XML documents at 206 Mbps and provide a Giga bit level throughput.

BIOGRAPHY

Sheng-De Wang was born in Taiwan in 1957. He received the B.S. degree from National Tsing Hua University, Hsinchu, Taiwan, in 1980, and the M. S. and the Ph. D. degrees in electrical engineering from National Taiwan University, Taipei, Taiwan, in 1982 and 1986, respectively.
Since 1986 he has been on the faculty of the department of electrical engineering at National Taiwan University, Taipei, Taiwan, where he is currently a professor. From 1995 to 2001, he also served as the director of computer operating group of computer and information network center, National Taiwan University. He was a visiting scholar in Department of Electrical Engineering, University of Washington,

Seattle during the academic year of 1998-1999. From 2001 to 2003, He has been served as the Department Chair of Department of Electrical Engineering, National Chi Nan University, Puli, Taiwan for the 2-year appointment. His research interests include embedded systems, reconfigurable computing, and intelligent systems. Dr. Wang is a member of the Association for Computing Machinery and IEEE computer societies. He is also a member of Phi Tau Phi Honor society.

*Session : **D2-W3-T3: Nanotechnology***

Session Organizer & Chair

Ching-Fuh Lin, PhD (林清富 教授**)**

Professor, Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering,
National Taiwan University
No. 1, Sec. 4, Roosevelt Road, Taipei, Taiwan
Tel: +886-2-33663540, Fax: +886-2-23642603
Email: cflin@cc.ee.ntu.edu.tw

BIOGRAPHY

Dr. Ching-Fuh Lin obtained the B.S. degree from National Taiwan University in 1983, and the M.S. and Ph.D. degrees from Cornell University, Ithaca, NY, in 1989 and 1993, respectively, all in electrical engineering. He is now a joint professor in the Graduate Institute of Photonics and Optoelectronics, Graduate Institute of Electronics Engineering, and Department of Electrical Engineering at National Taiwan University. His research interests include organic-inorganic composite thin-film solar cells and optoelectronic devices, Si nanowire solar cells, Si-based photonics, and physics in broadband semiconductor lasers and optical amplifiers.

He is currently a Fellow of IEEE, Fellow of SPIE, Member of Asia-Pacific Academy of Materials, and a member of OSA. He has published about 130 journal papers and more than 300 conference papers and hold over 30 patents. He is also the sole author of a book, Optical Components for Communications: Principles and Applications, published by Kluwer Academic Publishers (USA 2004). He had obtained 5 times of Class A Research Awards and the Distinguished Research Award from National Science Council of Taiwan, ROC, and the Outstanding Electrical Engineering Professor Award from the Chinese Institute of Electrical Engineering. He and his students had also been granted the 18th Acer Research Golden Award, 18th Acer Research Excellent Award, 14th Acer Research Excellent Award, Collins Thesis Awards for years 1998, 2001, 2002, 2004, 2007, and 2009.

Prof. Lin has served as the Chair of IEEE LEOS Chapter Taipei Section, the Board member of the 17th IEEE Taipei Section, the Evaluation Committee member of Higher Education Evaluating & Accreditation Council of Taiwan, the Council member of the 10th Optical Engineering Society of ROC, and the Convener in the area of Electronics and Information for the Conventional Industry Technology Development

Project in the Bureau of Industry, Ministry of Economics, ROC. He has also served as Project Instructors of the National Programs in the nano-science and nano- technology and the renewable energy (solar energy).

Session : D2-W3-T3: Nanotechnology

Well-Aligned Multi-Walled Carbon Nanotubes Emitting Natural White-Light under Microwave Irradiation

Kuan-Jiuh Lin, PhD (林寬鋸 教授)

Professor, Department of Chemistry, National Chung Hsing University, Taichung 402, Taiwan
Tel: +886-4-22870515, Fax: +886-4-22854488
Email: kjlin@dragon.nchu.edu.tw

ABSTRACT

Carbon nanotube forest (namely, CNT-forest), freestanding vertically from the substrate, is an important core-structure for fuel cell electrocatalysts, engineering optical polarizers, and field-emitter arrays for flat-panel displays. Large quantities of CNT-forest sheets can now be produced by wet- and dry-state spinning techniques. Highly efficient synthesis of CNT-forest has been achieved through chemical vapor deposition growth. However, low-cost black coating with large-scale CNT-forest from water-soluble carbon nanotubes still presents a great challenge. The main challenge to the fabrication of CNT-forest is dispersing the carbon naotubes at high enough concentration suitable for efficient alignment and effective coagulation. In this report, we successfully prepared high concentrations of nanocomposites comprising multi-walled carbon nanotubes well-dispersive in water-soluble poly(vinyl alcohol) (PVA) matrix. Afterward, CNT-forest was achieving in the course of PVA-burning carbonaceous crust. This approach represents a novel methodology to make large quantities of highly aligned carbon nanotubes.
More importantly, the CNT-forest has the polychromatic emission spectra when ignited it inside a home-made microwave oven. The CIE 1931 (x, y) coordinate is (0.327, 0.349) that is very closed to the CIE coordinates for a pure white-light, (0.333, 0.333). The new lighting has three significant contributions in carbon technology. First, having individual narrow-bands RGB trichromatic emission wavelengths, a brilliant color gamut can be achieved through the dramatic fabrication. Second, unlike today's conventional lighting, the future CNT-forest bulbs contain no mercury and have no electrode to wear out, which is a key metric for energy saving consideration. Third, ruling out gas discharge sparked by microwave, the low thermal-radiation implementation play a key role towards the commercial viability of electrodeless of CNT-forest lighting systems. Due to the low-cost coating technology, we firmly believe that the CNT-forest illumination technology will come into blossom in the future.

BIOGRAPHY

Education:

B.S. 1984 – 1988 Department of Chemistry, Tankang University
M.S. 1988 – 1990 Department of Chemistry, National Taiwan University
Ph. D. 1990 – 1993 Department of Chemistry, National Taiwan University

Professional Appointments:

2003 – 2009 Director of Center of Nanoscience and Nanotechnology, National Chung Hsing University
2005/2- Professor, Department of Chemistry, National Chung Hsing University
2002/2 - 2005/1 Associate Professor, Department of Chemistry, National Chung Hsing University
1999/8 – 2002/1 Assistant Professor, Department of Chemistry, National Chung Hsing University
1993/10 - 1999/7 Post-Doctoral fellowship, Institute of Chemistry, Academia Sinica, Taipei

Honors and Awards:

Academia Sinica Outstanding Research Award 2000
National Science Council Research Award, 1999-2001
Junior Research Faculty Award of National Chung-Hsing University, 2004
Chinese Chemical Association Outstanding Research Award, 2004
National Science Council Wu Da-Yuo Award, 2004
Y. Z. Hsu Outstanding Scientific Paper Award for Nanoscience and Technology, 2005 (Far Easterm Foundation)

Research Interests:

1. Fabrication of plasmonics for bio-chips
2. Fabrication of transparent conductive films
3. Energy-saving materials for LED –lighting, DSSC, and Low-Emissivity Glasses

Selected Publications:

1. Nujiang Tang, Waston Kuo, Chienchung Jeng, Liyuan Wang, **Kuan-Jiuh Lin** and Youwei Du, "Coil-in-Coil Carbon Nanocoils: 11 Gram-Scale Synthesis, Single Nanocoil Electrical Properties, and Electrical Contact Improvement" *ACS Nano*, **2010**, ***4*** (2), 781–788. (Impact factor: 5.472)
2. Nujiang Tang, Jianfeng Wen, Yang Zhang, Fanxin Liu, **Kuan-Jiuh Lin** and Youwei Du, "Helical Carbon Nanotubes: Catalytic Particle Size-Dependent Growth and Magnetic Properties" *ACS Nano*, **2010**, ***4*** (1), 241–250. (Impact factor: 5.472)
3. Wen Yin Lynn Ko, Hitesh G. Bagaria, Subashini Asokan, **Kuan-Jiuh Lin**, and Michael S. Wong, "CdSe Tetrapod Synthesis Using Cetyltrimethylammonium Bromide and Heat Transfer Fluids" *Journal of Materials Chemistry* **(2010) DOI: 10.1039/b922145j** (Impact factor: 4.646)
4. Wei-Hung Chen, Wen-Yin Ko, Ying-Shiou Chen, Ching-Yuan Cheng, Chi-Ming Chan, and **Kuan-Jiuh Lin**, "Growth of Copper Phthalocyanine Rods on Au Plasmon Electrodes through Micelle Disruption Methods" *Langmuir* **(2010)** 26, 2191–2195. (Impact factor: 4.097)
5. Hsu Chuen-Yuan, Huang Jing-Wen, Gwo Shangjr, **Lin Kuan-Jiuh**, "The facile fabrication of tunable plasmonic gold nanostructure arrays using microwave plasma" *Nanotechnology*, **(2010)**, 21(3), 035302/1-035302/6. (Impact factor: 3.446)
6. Su, Jun-Wei, Gwo, Shangjr. **Lin, Kuan-Jiuh**, "Well-aligned multi-walled carbon nanotubes emitting natural white-light under microwave irradiation" *Chemical Communications* **(2009)**, 44, 6777-6779. (Impact factor :5.141)

*Session : **D2-W3-T3: Nanotechnology***

Electrodeposition of Gold, Silver on Carbon Nanotube Thin Films

Si-Ty Lam, PhD

Principal Project Scientist
HP Laboratories
Hewlett-Packard Company
Palo Alto, California 94304, USA
Tel: +1-650-857-7204, Fax: +1-650-852-8579
Email: sity.lam@hp.com

ABSTRACT

In a carbon nanotube (CNT) thin film, CNTs form complicated networks with numerous junctions where individual CNTs intersect or simply contact other CNTs. This results in a significant reduction of the electrical conductivity of the film as compared with the intrinsic conductivity of the CNT. Because of this, the current state of the art CNT films are unsuitable for many information display applications. We were able to overcome this issue by developing an electrodeposition process in which a precise amount of metal such as gold or silver was deposited onto CNT films. This process uniquely allows a small amount of metal to be preferentially and uniformly deposited on the CNTs and at CNT junctions. With additional heat treatment, the conductivity of the CNT film increases by more than four times while its optical transmittance remains unchanged.

BIOGRAPHY

[photo]

Dr. Si-Ty Lam is a Principal Project Scientist in the Information Surfaces Lab of HP Laboratories, Hewlett-Packard Company. He received his PhD degree in Materials Science and Engineering from the University of California, Davis, in 1979. He was an Advisory Engineer at IBM (1979-1983), Wafer Fab Engineering Manager at Magnex Corporation (1984), prior to joining Hewlett-Packard Company (1984-present).
His research activities for the past three decades have been in the areas of thermal inkjet printing, information storage and information display devices, materials and manufacturing processes. His current research focuses on creating new technologies for updatable, low-cost printable display surfaces that combine the best features of existing displays and print. He has over 25 patents and 20 journal publications.
Dr. Lam is a member of the Materials Research Society, Society for Information Display, American Chemical Society, Electrochemical Society, Engineering Honors Society (Tau-Beta-Pi) and National Geography Society.

Session : ***D2-W4-T3: Communication System-on-Chip***

Session Organizer & Chair

Chen-Yi Lee, PhD (李鎮宜 研發長)

Professor, Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering,
National Taiwan Univserity
No. 1, Sec. 4, Roosevelt Road, Taipei, Taiwan
Tel: +886-2-33663540, Fax: +886-2-23642603
Email: cflin@cc.ee.ntu.edu.tw

BIOGRAPHY

....

*Session : **D2-W4-T3: Communication System-on-Chip***

Recent Progress in Communications SoC's

Chen-Yi Lee, PhD (李鎮宜 研發長)

Professor, Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering,
National Taiwan Univserity
No. 1, Sec. 4, Roosevelt Road, Taipei, Taiwan
Tel: +886-2-33663540, Fax: +886-2-23642603
Email: cflin@cc.ee.ntu.edu.tw

ABSTRACT

...

BIOGRAPHY

....

*Session : **D2-W4-T3: Communication System-on-Chip***

Physical Design Challenge to Cognitive Radio/Software Defined Radio

Kazuya Masu, PhD (益一哉 教授**)**

Professor, Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering,
National Taiwan Univserity
No. 1, Sec. 4, Roosevelt Road, Taipei, Taiwan
Tel: +886-2-33663540, Fax: +886-2-23642603
Email: cflin@cc.ee.ntu.edu.tw

ABSTRACT

...

BIOGRAPHY

....

*Session : **D2-W4-T3: Communication System-on-Chip***

Recent Progress in Design Methodologies for Software Defined Radio

Yu-Hen Hu, PhD (胡玉衡 教授)

Professor, Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering,
National Taiwan Univserity
No. 1, Sec. 4, Roosevelt Road, Taipei, Taiwan
Tel: +886-2-33663540, Fax: +886-2-23642603
Email: cflin@cc.ee.ntu.edu.tw

ABSTRACT

...

BIOGRAPHY

....

Session : D2-W3-T4: Nanotechnology

Session Organizer & Chair

Hsien-Hung Wei, PhD (魏憲鴻 教授**)**

Department of Chemical Engineering
National Cheng Kung University
Tainan 701, Taiwan
Tel: +886-6-2757575 ext. 62691, Fax: +886-6-2344496
Email: hhwei@mail.ncku.edu.tw

BIOGRAPHY

Dr. Hsien-Hung Wei received his BS in Chemical Engineering from National Taiwan University in 1991. After military service, he attended the City University of New York for advanced study in the area of fluid mechanics and obtained his Ph.D. in Chemical Engineering in 2000. He then went to University of Michigan and conducted his postdoctoral research in the fields of biofluid mechanics and microfluidics. In 2003, he joined the faculty in the Department of Chemical Engineering at National Cheng Kung University (NCKU) in Taiwan. Currently, he is an Associate Professor.

His research interests are microfluidics and nanofluidics, emphasizing applying small-scale physics and engineering principles for functional synthesis, guiding colloidal/molecular assembly, and manipulating fluid flows. Along this line, his research group has been exploring a diversity of subjects, including development of integrated platforms for molecular sensing and detection, exploitation of AC electrokinetics for enhancing functionalities of micro/nanodevices, use of stretched DNA in developing molecular assays, design of micro/nano swimmers for controlling their self organizing behavior, and flow-mediated formation of ordered nano/microscale materials. Combining both theoretical and experimental studies, his team not only identifies how systems are characterized by relevant length and time scales to quantify the effects at work, but also utilizes such fundamental knowledge for design, control, and optimization of processes.

Dr. Wei has published more than 30 articles, covering various topics in fluid mechanics, colloidal and surface science, applied physics, and microfluidics. He is the recipient of the Young Investigator Award (in memory of Dr. Wu, Da-You) from National Science Council of Taiwan in 2007. He was selected as a Rising Star by the School of Engineering at NCKU in 2007 and 2008. He also received the Best Paper Award from the Taiwan Institute of Chemical Engineers in 2008.

Session : D2-W3-T4: Nanotechnology

New Paradigms for Manipulation of DNA Molecules at the Nanoliter Scale

Hsien-Hung Wei, PhD (魏憲鴻 教授**)**

Department of Chemical Engineering
National Cheng Kung University
Tainan 701, Taiwan
Tel: +886-6-2757575 ext. 62691, Fax: +886-6-2344496
Email: hhwei@mail.ncku.edu.tw

ABSTRACT

Thanks to the recent advance in micro/nano technology, it now becomes possible to manipulate objects at the molecular level. Much attention has turned to DNA, since it not only is a biomolecule that carries genetic information but also possesses unique physical and chemical properties that can be used in various applications. In this talk, I will discuss strategies for on-chip manipulation of DNA, and in particular demonstrate our recent efforts on the use of applied force fields in realizing trapping, stretching, combing, and assembly of DNA molecules. Roles of confinement and surface surfactant will also be illuminated for a judicious control of the dynamics of a single DNA molecule.

BIOGRAPHY

Dr. Hsien-Hung Wei received his BS in Chemical Engineering from National Taiwan University in 1991. After military service, he attended the City University of New York for advanced study in the area of fluid mechanics and obtained his Ph.D. in Chemical Engineering in 2000. He then went to University of Michigan and conducted his postdoctoral research in the fields of biofluid mechanics and microfluidics. In 2003, he joined the faculty in the Department of Chemical Engineering at National Cheng Kung University (NCKU) in Taiwan. Currently, he is an Associate Professor.

His research interests are microfluidics and nanofluidics, emphasizing applying small-scale physics and engineering principles for functional synthesis, guiding colloidal/molecular assembly, and manipulating fluid flows. Along this line, his research group has been exploring a diversity of subjects, including development of integrated platforms for molecular sensing and detection, exploitation of AC electrokinetics for enhancing functionalities of micro/nanodevices, use of stretched DNA in developing molecular assays, design of micro/nano swimmers for controlling their self organizing behavior, and flow-mediated formation of ordered nano/microscale materials. Combining both theoretical and experimental studies, his

team not only identifies how systems are characterized by relevant length and time scales to quantify the effects at work, but also utilizes such fundamental knowledge for design, control, and optimization of processes.

Dr. Wei has published more than 30 articles, covering various topics in fluid mechanics, colloidal and surface science, applied physics, and microfluidics. He is the recipient of the Young Investigator Award (in memory of Dr. Wu, Da-You) from National Science Council of Taiwan in 2007. He was selected as a Rising Star by the School of Engineering at NCKU in 2007 and 2008. He also received the Best Paper Award from the Taiwan Institute of Chemical Engineers in 2008.

Session : ***D2-W3-T4: Nanotechnology***

...

Bo Zhou, PhD

Department of Chemical Engineering
National Cheng Kung University
Tainan 701, Taiwan
Tel: +886-6-2757575 ext. 62691, Fax: +886-6-2344496
Email: hhwei@mail.ncku.edu.tw

ABSTRACT

....

BIOGRAPHY

...

Session : ***D2-W3-T4: Nanotechnology***

Synthesis and Post-Processing of Nanomaterials using Microreaction Technology

Chih-hung (Alex) Chang, PhD (張至弘 教授**)**

School of Chemical, Biological and Environmental Engineering
Oregon State University
Corvallis OR 97331, USA
Tel: +1-541-737-8548, Fax: +1-541-737-4600
Email: changch@che.orst.edu

ABSTRACT

A critical barrier to the routine use of nanomaterials is the tedious, expensive means of their synthesis. Microreaction technology takes advantage of the large surface area-to-volume ratios within microchannel structures to accelerate heat and mass transport. This accelerated transport allows for rapid changes in reaction temperatures and concentrations leading to more uniform heating and mixing which can have dramatic impacts on macromolecular yields and nanoparticle size distributions. Benefits of microrecation technology include higher yield and reactant conversion, better energy efficiency and less by-product generation. Microreators can help minimize the environmental impact of nanoproduction by enabling solvent free mixing, integrated separation techniques and reagent recycling. The possibility of synthesizing nanomaterials in the required volumes at the point-of-use eliminates the need to store and transport potentially hazardous materials and provides the flexibility for tailoring complex functional nanomaterials. Continuous flow microreactors have been used by several research groups to synthesize and characterize nanomaterials. An overview of these efforts and issues related to scale up and other post synthesis processes such as separation and deposition are presented in this talk.

BIOGRAPHY

Chih-hung (Alex) Chang was born in Taipei, Taiwan 1969. He received a B.S. degree from the Department of Chemical Engineering, National Taiwan University in June 1991. He received his PhD degree in chemical engineering from University of Florida, Gainesville Florida in December 1999.

He did a research project to study deposition of thin film platinum on titanium substrates using electrochemical methods. He received a graduate fellowship from the Department of Chemical Engineering, University of Florida, and started the graduate program in August 1994. His dissertation research concerned the development of a manufacturing process for the growth of thin-film photovoltaic cells using rapid thermal processing under Prof. Timothy J. Anderson's guidance. He joined Oregon State University in January, 2000. He is currently a full professor in the School of Chemical, Biological, and Environmental Engineering. He was a visiting professor in the Materials Science and Engineering Department at National Taiwan University from April 2008 till September 2008 sponsored by the National Science Council of Taiwan.

Prof. Chang is a member of a number of professional societies including American Institute of Chemical Engineers, The Electrochemical Society, American Vacuum Society, American Chemical Society, and Material Research Society. He is a SHARP Labs of America scholar and a recipient of AVS Graduate Research award, National Science Foundation's CAREER award, and awardees of W. M. Keck Foundation. His group has studied solution based thin film deposition processes, ink jet printing, microreaction technology, and X-ray absorption fine structure. He has more than 55 refereed publications, 2 issued patents, and 10 pending patents in these areas.

Session : ***D2-W4-T4: New Multimedia and Entertainment Technology***

Session Organizer & Chair

Scott Chun-Yang Chen, PhD (陳俊仰 博士**)**

Department of Chemical Engineering
National Cheng Kung University
Tainan 701, Taiwan
Tel: +886-6-2757575 ext. 62691, Fax: +886-6-2344496
Email: hhwei@mail.ncku.edu.tw

BIOGRAPHY

....

Session : ***D2-W4-T4: New Multimedia and Entertainment Technology***

Data Infrastructure at Facebook

Scott Chun-Yang Chen, PhD (陳俊仰 博士**)**

Department of Chemical Engineering
National Cheng Kung University
Tainan 701, Taiwan
Tel: +886-6-2757575 ext. 62691, Fax: +886-6-2344496
Email: hhwei@mail.ncku.edu.tw

ABSTRACT

...

BIOGRAPHY

....

*Session : **D2-W4-T4: New Multimedia and Entertainment Technology***

Mine Your Business! -- Value and Utilization of Implicit Social Networks

Ching-Yung Lin, PhD (林清詠 博士)

Department of Chemical Engineering
National Cheng Kung University
Tainan 701, Taiwan
Tel: +886-6-2757575 ext. 62691, Fax: +886-6-2344496
Email: hhwei@mail.ncku.edu.tw

ABSTRACT

...

BIOGRAPHY

....

*Session : **D2-W4-T4: New Multimedia and Entertainment Technology***

Technical Challenge and Solutions in Web-based Video Conferencing System

Chuo-Lin Chang, PhD (張倬領 博士)

Department of Chemical Engineering
National Cheng Kung University
Tainan 701, Taiwan
Tel: +886-6-2757575 ext. 62691, Fax: +886-6-2344496
Email: hhwei@mail.ncku.edu.tw

ABSTRACT

...

BIOGRAPHY

....