

CONTACT	Department of Electrical and Computer Engineering Oakland University, Rochester, MI 48309, USA	248-370-4797   <a href="mailto:junchen@oakland.edu">junchen@oakland.edu</a> <a href="http://www.secs.oakland.edu/~junchen">www.secs.oakland.edu/~junchen</a>   <a href="http://jchen2020.net">jchen2020.net</a>
EDUCATION	<b>Ph.D. in Electrical Engineering</b> (minor in CS), Iowa State University, Ames IA, 4.0/4.0 <b>B. S. in Automation</b> , Zhejiang University, Hangzhou China	12/2014 06/2009
RESEARCH INTERESTS	<b>Systems and Control:</b> Model predictive control, optimal control, stochastic processes, event-triggered control <b>Artificial Intelligence:</b> Reinforcement learning, deep learning, time series, generative adversary network <b>Intelligent Vehicles:</b> Autonomous vehicle, electric vehicle, battery control, vehicle dynamics, co-simulation <b>Power &amp; Energy:</b> Hybrid energy systems, renewable energy, power electronics, battery, economic analysis <b>Discrete Event and Hybrid Systems:</b> failure diagnosis and prognosis, resiliency, privacy, verification	
EMPLOYMENT	<b>Assistant Professor</b> , ECE Department, Oakland University, Rochester MI, USA <b>Senior Control Systems Engineer</b> , General Motors, Milford MI, USA <b>R&amp;D Scientist</b> in <i>Power and Energy Systems</i> , Idaho National Laboratory, ID, USA <b>Summer Intern</b> in <i>Software V&amp;V</i> , General Motors R&D, MI, USA <b>Research Assistant</b> in <i>Stochastic Hybrid Systems</i> , Iowa State University, IA, USA <b>Teaching Assistant</b> in <i>Electrical Engineering</i> , Iowa State University, IA, USA	08/2020–present 01/2017–08/2020 11/2014–12/2016 04/2014–07/2014 01/2011–10/2014 01/2011–12/2013
HONORS AND RECOGNITIONS	<b>NSF CAREER Award</b> , National Science Foundation <b>IEEE Best Paper Award</b> , IEEE Transactions on Automation Science and Engineering <b>Best Paper Award</b> , IEEE International Conference on Electro-Information Technology <b>Most Active Grant Seeker Award</b> , Oakland University <b>Faculty Recognition Award for Research</b> , Oakland University <b>R&amp;D 100 Award</b> (for work at INL), R&D World <b>Associate Editor</b> , IEEE International Conference on Robotics and Automation <b>IEEE Senior Member</b> <b>Associate Editor</b> , IEEE Conference on Control Technology and Applications <b>Associate Editor</b> , IFAC International Symposium on Advances in Automotive Control <b>Undergraduate Research Competition Winner</b> (my advisee), ASME ICE Division <b>INL Publication Achievement Award</b> , Idaho National Laboratory <b>Research Excellence Award</b> , Iowa State University <b>Student Travel Award</b> , American Control Conference <b>Third Class Scholarship for Undergraduate Student</b> , Zhejiang University <b>Outstanding Student</b> , Zhejiang University	2022 2016 2023 2023 2023 2023 2020 2020 2023–present 2022 2022 2016 2014 2014 2008 2008
SELECTED GRANTS	<b>Total ~\$795k</b> [5] <b>Jun Chen</b> , \$40,000, “Sensor Reduction for Battery Cell State-of-Charge Estimation,” 01/2024–12/2024, MEDC ADVANCE Proof-of-Concept Fund. [4] <b>Jun Chen</b> , \$500,000, “CAREER: Reconfigurable and Predictive Control with Reinforcement Learning Supervisor for Active Battery Cell Balancing,” 01/2023–12/2027, NSF-ECCS-EPCN. [3] Yang Chen, <b>Jun Chen</b> and Om Prakash Yadav, \$75,000, “Ocean Energy Supported Multi-Energy System Planning and Operation Optimization for Sustainable Coastal Community,” 07/2023–06/2024, Coastal Studies Institute, North Carolina Renewable Ocean Energy Program. [2] <b>Jun Chen</b> , \$10,000, “Extending Electric Vehicle Driving Range using Artificial Intelligence,” 05/2023–04/2024, University Research Committee, Oakland University. [1] <b>Jun Chen</b> , \$10,000, “Impacts of Battery Cell Imbalance and Mitigation by AI and Controls,” 05/2022–05/2023, Michigan Space Grant Consortium.	

**Patents**

- [4] Min Sun, Yiran Hu, David Edwards, **Jun Chen**, Insu Chang and Steven Moorman, “[Active Thermal Management System and Method for Flow Control](#),” U.S. Patent No. US11312208 B2, April 26, 2022.
- [3] **Jun Chen**, Ruixing Long and Yiran Hu, “[Method for Increasing Control Performance of Model Predictive Control Cost Functions](#),” U.S. Patent No. US11192561 B2, December 7, 2021.
- [2] Yiran Hu, David Edwards, Michael Paratore Jr, Min Sun, **Jun Chen**, Eugene Gonze and Sergio Quelhas, “[Method and Apparatus for Control of Propulsion System Warmup Based on Engine Wall Temperature](#),” U.S. Patent No. 11078825 B2, August 3, 2021.
- [1] **Jun Chen**, David Edwards, Yiran Hu, Min Sun, Adam J. Heinzen and Michael A. Smith, “[Method and System for Determining Thermal State](#),” U.S. Patent No. 10995688 B2, May 4, 2021.

**Book Chapter**

- [1] Mariam Ibrahim, **Jun Chen** and Ratnesh Kumar, “[Quantification of Centralized/Distributed Secrecy in Stochastic Discrete Event Systems](#),” in *Recent Advances in Systems Safety and Security*, Editors: Emil Pricop and Grigore Stamatescu, Springer, May 2016, ISBN: 978-3-319-32523-1.

**Journal Articles**

- [36] Ali Irshayyid, **Jun Chen**\* and Guojiang Xiong “[A Review on Reinforcement Learning-based Highway Autonomous Vehicle Control](#),” *Green Energy and Intelligent Transportation*, (Accepted for Publication January 2024).
- [35] Mingqiang Wang, Lei Zhang, **Jun Chen**, Zhiqiang Zhang, Zhenpo Wang and Dongpu Cao, “[A Hybrid Trajectory Prediction Framework for Automated Vehicles with Attention Mechanisms](#),” *IEEE Transactions on Transportation Electrification* (Accepted for Publication December 2023).
- [34] Fengying Dang, Dong Chen, **Jun Chen**\* and Zhaojian Li\*, “[Event-Triggered Model Predictive Control with Deep Reinforcement Learning for Autonomous Driving](#),” *IEEE Transactions on Intelligent Vehicles*, (Accepted for Publication October 2023).
- [33] Kaixiang Zhang, Kaian Chen, Zhaojian Li, **Jun Chen** and Yang Zheng, “[Privacy-Preserving Data-Enabled Predictive Leading Cruise Control in Mixed Traffic](#),” *IEEE Transactions on Intelligent Transportation Systems* (Accepted for Publication October 2023).
- [32] **Jun Chen**\*, Aman Behal, Zhaojian Li and Chong Li, “[Active Battery Cell Balancing by Real Time Model Predictive Control for Extending Electric Vehicle Driving Range](#),” *IEEE Transactions on Automation Science and Engineering*, (Accepted for Publication June 2023).
- [31] Lei Zhang, Qi Wang, **Jun Chen**, Zhenpo Wang and Shaohua Li, “[Brake-by-Wire System for Passenger Cars: A Review of Structure, Control, Key Technologies, and Application in X-by-Wire Chassis](#),” *eTransportation*, volume 18, number 1, pages 1–15, October 2023.
- [30] **Jun Chen**\*, Xiangyu Meng and Weinan Gao, “[Preface: Recent Advances on Learning-Based Control - Theory and Application](#),” *International Journal of Modelling, Identification and Control*, volume 43, number 3, pages 177-178, October 2023.
- [29] Mohammad R. Hajidavalloo, **Jun Chen**\*, Qiuha Hu, Ziyu Song, Xunyu Yin and Zhaojian Li, “[NMPC-based Integrated Thermal Management of Battery and Cabin for Electric Vehicles in Cold Weather Conditions](#),” *IEEE Transactions on Intelligent Vehicles*, volume 8, number 9, pages 4208–4222, September 2023.
- [28] Christopher Rother, Zhaodong Zhou and **Jun Chen**\*, “[Development of a Four-Wheel Steering Scale Vehicle for Research and Education on Autonomous Vehicle Motion Control](#),” *IEEE Robotics and Automation Letters*, volume 8, number 8, pages 5015–5022, August 2023.
- [27] Zhaodong Zhou, Christopher Rother and **Jun Chen**\*, “[Event-Triggered Model Predictive Control for Autonomous Vehicle Path Tracking: Validation using CARLA Simulator](#),” *IEEE Transactions on Intelligent Vehicles*, volume 8, number 6, pages 3547–3555, June 2023.

- [26] **Jun Chen\***, “[A Probabilistic Test for A-Diagnosability of Stochastic Discrete-Event Systems with Guaranteed Error Bound](#),” *IEEE Control Systems Letters*, volume 7, number 1, pages 2833–2838, June 2023.
- [25] Zaiyu Gu, Guojiang Xiong, Xiaofan Fu, Ali Wagdy Mohamed, Mohammed Azmi Al-Betar, Hao Chen and **Jun Chen**, “[Extracting Accurate Parameters of Photovoltaic Cell Models via Elite Learning Adaptive Differential Evolution](#),” *Energy Conversion and Management*, volume 285, pages 1–25, June 2023.
- [24] Qinghua Liu, Guojiang Xiong, Xiaofan Fu, Ali Wagdy Mohamed, Jing Zhang, Mohammed Azmi Al-Betar, Hao Chen, **Jun Chen** and Sheng Xu, “[Hybridizing Gaining-Sharing Knowledge and Differential Evolution for Large-scale Power System Economic Dispatch Problems](#),” *Journal of Computational Design and Engineering*, volume 10, number 2, pages 615–631, April 2023.
- [23] Ali Irshayyid and **Jun Chen\***, “[Comparative Study of Cooperative Platoon Merging Control Based on Reinforcement Learning](#),” *Sensors*, volume 23, number 2-990, pages 1–23, January 2023.
- [22] **Jun Chen\***, Zhaodong Zhou, Ziwei Zhou, Xia Wang and Boryann Liaw, “[Impact of Battery Cell Imbalance on Electric Vehicle Range](#),” *Green Energy and Intelligent Transportation*, volume 1, number 3, pages 1–8, December 2022.
- [21] **Jun Chen\*** and Ratnesh Kumar, “[Stochastic Failure Prognosis of Discrete Event Systems](#),” *IEEE Transactions on Automatic Control*, volume 67, number 10, pages 5487–5492, October 2022.
- [20] **Jun Chen\*** and Junhui Zhao, “[Generating Synthetic Wind Speed Scenarios using Artificial Neural Networks for Probabilistic Analysis of Hybrid Energy Systems](#),” *International Journal of Modelling, Identification and Control*, volume 41, number 3, pages 183–192, July 2022.
- [19] Xuan Xie, Guojiang Xiong, **Jun Chen** and Jing Zhang, “[Universal Transparent Artificial Neural Network-Based Fault Section Diagnosis Models for Power Systems](#),” *Advanced Theory and Simulations*, volume 5, number 4, pages 1–12, April 2022.
- [18] Guojiang Xiong, Xufeng Yuan, Ali Wagdy Mohamed, **Jun Chen** and Jing Zhang, “[Improved Binary Gaining-sharing Knowledge based Algorithm with Mutation for Fault Section Location in Distribution Networks](#),” *Journal of Computational Design and Engineering*, volume 9, number 2, pages 393–405, April 2022.
- [17] **Jun Chen\*** and Ramesh S, “[Model-based Validation of Diagnostic Software with Application in Automotive Systems](#),” *IET Cyber-Systems and Robotics*, volume 3, number 2, pages 140–149, June 2021.
- [16] **Jun Chen\***, “[Extended Kalman Filter Steady Gain Scheduling using  \$k\$ -means Clustering](#),” *International Journal of Modelling, Identification and Control*, volume 34, number 2, pages 158–162, February 2020.
- [15] Xiang Yin, **Jun Chen**, Zhaojian Li and Shaoyuan Li, “[Robust Fault Diagnosis of Stochastic Discrete Event Systems](#),” *IEEE Transactions on Automatic Control*, volume 64, number 10, pages 4237–4244, October 2019.
- [14] **Jun Chen**, Qin Wang, Jianming Lian and Wanning Li, “[Guest Editorial: Advances in Control and Decision for Power and Energy Systems](#),” *Journal of Control and Decision*, volume 5, number 2, pages 115–116, February 2018.
- [13] **Jun Chen**, Christoforos Keroglou, Christoforos N. Hadjicostis and Ratnesh Kumar, “[Revised Test for Stochastic Diagnosability of Discrete-Event Systems](#),” *IEEE Transactions on Automation Science and Engineering*, volume 15, number 1, pages 404–408, January 2018.
- [12] **Jun Chen**, Peter Molnar and Aman Behal, “[Identification of a Stochastic Resonate-and-Fire Neuronal Model via Nonlinear Least Squares and Maximum Likelihood Estimation](#),” *International Journal of Modelling, Identification and Control*, volume 28, number 3, pages 221–231, October 2017.
- [11] **Jun Chen** and Cristian Rabiti, “[Synthetic Wind Speed Scenarios Generation for Probabilistic Analysis of Hybrid Energy Systems](#),” *Energy*, volume 120, pages 507–517, February 2017.
- [10] **Jun Chen**, Mariam Ibrahim and Ratnesh Kumar, “[Quantification of Secrecy in Partially Observed Stochastic Discrete Event Systems](#),” *IEEE Transactions on Automation Science and Engineering*, volume 14, number 1, pages 185–195, January 2017.
- [9] Jong S. Kim, **Jun Chen** and Humberto E. Garcia, “[Modeling, Control, and Dynamic Performance Analysis of a Reverse Osmosis Desalination Plant Integrated within Hybrid Energy Systems](#),” *Energy*, volume 112, pages 52–66, October 2016.

- [8] **Jun Chen** and Humberto E. Garcia, “[Economic Optimization of Operations for Hybrid Energy Systems under Variable Markets](#),” *Applied Energy*, volume 177, pages 11–24, September 2016.
- [7] **Jun Chen**, Humberto E. Garcia, Jong S. Kim and Shannon M. Bragg-Sitton, “[Operations Optimization of Nuclear Hybrid Energy Systems](#),” *Nuclear Technology*, volume 195, number 2, pages 143–156, August 2016.
- [6] Humberto E. Garcia, **Jun Chen**, Jong S. Kim, Richard B. Vilim, William R. Binder, Shannon M. Bragg-Sitton, Richard D. Boardman, Michael G. McKellar and Christiaan J. J. Paredis, “[Dynamic Performance Analysis of Two Regional Nuclear Hybrid Energy Systems](#),” *Energy*, volume 107, pages 234–258, July 2016.
- [5] **Jun Chen** and Ratnesh Kumar, “[Fault Detection of Discrete-Time Stochastic Systems Subject to Temporal Logic Correctness Requirements](#),” *IEEE Transactions on Automation Science and Engineering*, volume 12, number 4, pages 1369–1379, October 2015. (**IEEE Best Paper Award**: [link](#))
- [4] **Jun Chen** and Ratnesh Kumar, “[Stochastic Failure Prognosability of Discrete Event Systems](#),” *IEEE Transactions on Automatic Control*, volume 60, number 6, pages 1570–1581, June 2015.
- [3] **Jun Chen** and Ratnesh Kumar, “[Failure Detection Framework for Stochastic Discrete Event Systems with Guaranteed Error Bounds](#),” *IEEE Transactions on Automatic Control*, volume 60, number 6, pages 1542–1553, June 2015.
- [2] **Jun Chen** and Ratnesh Kumar, “[Polynomial Test for Stochastic Diagnosability of Discrete Event Systems](#),” *IEEE Transactions on Automation Science and Engineering*, volume 10, number 4, pages 969–979, October 2013.
- [1] Lingfei Zhi, **Jun Chen**, Peter Molnar and Aman Behal, “[Weighted Least-Squares Approach for Identification of a Reduced-Order Adaptive Neuronal Model](#),” *IEEE Transactions on Neural Networks and Learning Systems*, volume 23, number 5, pages 834–840, May 2012.

#### Peer Reviewed Conference Articles

- [29] Mohammad R. Hajidavalloo, **Jun Chen**, Qiuhaohu and Zhaojian Li, “[Study on the Benefits of Integrated Battery and Cabin Thermal Management in Cold Weather Conditions](#),” *2023 American Control Conference*, San Diego, CA, May 31–June 2, 2023.
- [28] Zhaodong Zhou, **Jun Chen\***, Mingyuan Tao, Peng Zhang and Meng Xu, “[Experimental Validation of Event-Triggered Model Predictive Control for Autonomous Vehicle Path Tracking](#),” *IEEE International Conference on Electro Information Technology*, Romeoville, IL, May 18–20, 2023. (**Best Paper Award**: [link](#))
- [27] Yang Chen, **Jun Chen\***, Chenang Liu, Guodong Liu, Maximiliano Ferrari and Aditya Sundararajan, “[Integrated Modeling and Optimal Operation of Multi-Energy System for Coastal Community](#),” *IEEE International Conference on Electro Information Technology*, Romeoville, IL, May 18–20, 2023.
- [26] **Jun Chen\*** and Zhaodong Zhou, “[Battery Cell Imbalance and Electric Vehicles Range: Correlation and NMPC-based Balancing Control](#),” *IEEE International Conference on Electro Information Technology*, Romeoville, IL, May 18–20, 2023.
- [25] Steven DeCoste, Antonio Scalzi, **Jun Chen\*** and Dan DelVescovo\*, “[Minimizing Steady-State Testing Time in an Engine Dynamometer Laboratory](#),” *2023 SAE World Congress*, Detroit, MI, April 18–20, 2023.
- [24] Ranya Badawi and **Jun Chen\***, “[Performance Evaluation of Event-Triggered Model Predictive Control for Boost Converter](#),” *2022 IEEE Vehicle Power and Propulsion Conference*, Merced, CA, November 1–4, 2022.
- [23] Man Liang and **Jun Chen**, “[A Conceptual Design of Barking Drones Fleet Management to Detect and Repulse Cattle](#),” *21st Asia Pacific Automotive Engineering Conference*, Melbourne, Australia, October 3–5, 2022.
- [22] Ranya Badawi and **Jun Chen\***, “[Enhancing Enumeration-Based Model Predictive Control for DC-DC Boost Converter with Event-Triggered Control](#),” *European Control Conference*, London, UK, July 12–15, 2022.

- [21] **Jun Chen\***, Xiangyu Meng and Zhaojian Li, “[Reinforcement Learning-based Event-Triggered Model Predictive Control for Autonomous Vehicle Path Following](#),” *2022 American Control Conference*, Atlanta, GA, June 8–10, 2022.
- [20] **Shan Huang** and **Jun Chen\***, “[Event-triggered Model Predictive Control for Autonomous Vehicle with Rear Steering](#),” *2022 SAE World Congress*, Detroit, MI, April 5–7, 2022.
- [19] **Jun Chen\***, Aman Behal and Chong Li, “[Active Cell Balancing by Model Predictive Control for Real Time Range Extension](#),” *IEEE Conference on Decision and Control*, Austin, TX, USA, December 13–15, 2021.
- [18] **Jun Chen\*** and Zonggen Yi, “[Comparison of Event-Triggered Model Predictive Control for Autonomous Vehicle Path Tracking](#),” *2021 IEEE Conference on Control Technology and Applications*, San Diego, CA, August 8–11, 2021. (Invited Paper)
- [17] **Jun Chen\*** and Junhui Zhao, “[Synthetic Wind Speed Scenarios Generation using Artificial Neural Networks for Probabilistic Analysis of Hybrid Energy Systems](#),” *2021 IEEE International Symposium on Industrial Electronics*, Kyoto, Japan, June 20–23, 2021.
- [16] **Jun Chen\***, Man Liang and Xu Ma, “[Probabilistic Analysis of Electric Vehicle Energy Consumption Using MPC Speed Control and Nonlinear Battery Model](#),” *2021 IEEE Green Technologies Conference*, Denver, CO, April 7–9, 2021.
- [15] **Jun Chen\***, Zhaojian Li and Xiang Yin, “[Optimization of Energy Storage Size and Operation for Renewable-EV Hybrid Energy Systems](#),” *2021 IEEE Green Technologies Conference*, Denver, CO, April 7–9, 2021.
- [14] Aaron S. Epiney, Andrea Alfonsi, Cristian Rabiti and **Jun Chen**, “[Economic Assessment of Nuclear Hybrid Energy Systems: Optimization using RAVEN](#),” *2017 ANS Annual Meeting*, San Francisco, CA, June 11–15, 2017.
- [13] **Jun Chen**, Jong S. Kim and Cristian Rabiti, “[Probabilistic Analysis of Hybrid Energy Systems Using Synthetic Renewable and Load Data](#),” *2017 American Control Conference*, Seattle, WA, May 24–26, 2017.
- [12] **Jun Chen** and Humberto E. Garcia, “[Operations Optimization of Hybrid Energy Systems under Variable Markets](#),” *2016 American Control Conference*, Boston, MA, July 6–8, 2016.
- [11] Mariam Ibrahim, **Jun Chen** and Ratnesh Kumar, “[A Resiliency Measure for Electrical Power Systems](#),” *2016 IFAC/IEEE International Workshop on Discrete Event Systems*, Xi’an, China, May 30 – June 1, 2016.
- [10] Mariam Ibrahim, **Jun Chen** and Ratnesh Kumar, “[Quantification of Distributed Secrecy Loss in Stochastic Discrete Event Systems under Bounded-Delay Communications](#),” *2016 IFAC/IEEE International Workshop on Discrete Event Systems*, Xi’an, China, May 30 – June 1, 2016.
- [9] Mariam Ibrahim, **Jun Chen** and Ratnesh Kumar, “[An Information Theoretic Measure for Secrecy Loss in Stochastic Discrete Event Systems](#),” *2015 International Conference on Electronics, Computers and Artificial Intelligence – International Workshop on Systems, Safety and Security*, Bucharest, Romania, June 25–27, 2015.
- [8] **Jun Chen** and Ratnesh Kumar, “[Failure Prognosability of Stochastic Discrete Event Systems](#),” *2014 American Control Conference*, Portland, OR, June 4–6, 2014.
- [7] **Jun Chen** and Ratnesh Kumar, “[Pattern Mining for Predicting Critical Events from Sequential Event Data Log](#),” *2014 IFAC/IEEE International Workshop on Discrete Event Systems*, Paris-Cachan, France, May 14–16, 2014.
- [6] Mariam Ibrahim, **Jun Chen** and Ratnesh Kumar, “[Secrecy in Stochastic Discrete Event Systems](#),” *2014 IEEE International Conference on Networking, Sensing and Control*, Miami, FL, April 7–9, 2014.
- [5] **Jun Chen** and Ratnesh Kumar, “[Failure Diagnosis of Discrete-Time Stochastic Systems Subject to Temporal Logic Correctness Requirements](#),” *2014 IEEE International Conference on Networking, Sensing and Control*, Miami, FL, April 7–9, 2014.
- [4] **Jun Chen** and Ratnesh Kumar, “[Online Failure Diagnosis of Stochastic Discrete Event Systems](#),” *2013 IEEE Multi-Conference on Systems and Control – IEEE Conference on Computer Aided Control System Design*, Hyderabad, India, August 28–30, 2013.



- [3] **Jun Chen** and Ratnesh Kumar, “[Decentralized Failure Diagnosis of Stochastic Discrete Event Systems](#),” *2013 IEEE Conference on Automation Science and Engineering*, Madison, WI, August 17–21, 2013. (Invited Paper)
- [2] **Jun Chen** and Ratnesh Kumar, “[Polynomial Test for Stochastic Diagnosability of Discrete Event Systems](#),” *2012 IEEE Conference on Automation Science and Engineering*, Seoul, Korea, August 20–24, 2012.
- [1] **Jun Chen**, Jose Suarez, Peter Molnar and Aman Behal, “[Maximum Likelihood Parameter Estimation in a Stochastic Resonate-and-Fire Neuronal Model](#),” *2011 IEEE International Conference on Computational Advances in Bio and medical Sciences (ICCABS)*, Orlando, FL, February 3–5, 2011.

#### **Thesis and Dissertation**

- [2] **Jun Chen**, “[Failure Diagnosis and Prognosis in Stochastic Discrete-Event and Cyber-Physical Systems](#),” Ph.D. Dissertation, Department of Electrical and Computer Engineering, Iowa State University, Ames, IA, USA, August 2014.
- [1] **Jun Chen**, “On the Reliability of MVB Communication Network,” Bachelor’s Thesis, College of Electrical Engineering, Zhejiang University, China, June 2009.