

# Jui-Kun Peng

Argonne National Laboratory  
Nuclear Engineering Division  
9700 South Cass Avenue, Building 362  
Argonne, IL 60439  
phone: 630/252-6593  
e-mail: [jpeng@anl.gov](mailto:jpeng@anl.gov)

## Professional Experience

- **2005-Present.** Postdoctoral Appointee, Argonne National Laboratory
  - Analyze the system of hydrogen storage options including gaseous and liquid hydrogen storage, metal hydrides, chemical hydrides, carbon-based materials and new materials
  - Assess improvements needed in material properties and system configurations to achieve hydrogen storage targets
  - Develop and maintain software including General Computational Toolkit, MHtool and FCHtool
- **2000-2004.** Research Assistant, Illinois Institute of Technology
  - Investigated optimal sensor, actuator and operating point selections
  - Developed new formulations, theorems and methods providing an efficient technique to find the global optimal solutions for instrument and operating point selection problems
- **2001-2004.** Teaching Assistant, Illinois Institute of Technology. Helped students with homework and computer programming assignments in undergraduate and graduate process control courses.
- **1993-1995.** Research Assistant, National Central University, Taiwan
  - Prepared and studied microcapsules
  - Investigated the drug loss and release rate of microcapsules; release time for twenty percent of drugs could be modified from two hours to five days
  - Operated and managed instruments including gallons per cargo, scanning electron microscopy, Ultraviolet, infrared radiation and dissolution tester

## Education

- PhD, Chemical Engineering, Illinois Institute of Technology; Chicago, Illinois, 2004
- MS, Computer Science, Polytechnic University; Brooklyn, New York, 1999
- MS, Chemical Engineering, National Central University; Chung-li, Taiwan, 1995

## Awards

- Honorable Mention, CAST Directors' Award for Best Poster, AIChE (2004)

## **Publications & Presentations**

- Peng, J. K. and H. Chen, "The Preparation of Microcapsules by Using o/w Type Emulsion Nonsolvent-Addition Phase Separation: Study of Release Rate and Drug Loss," presented at the Fifteenth Annual Taiwan Conference on Polymer Science, Taiwan, June, 1995.
- Chmielewski, D. J., J. K. Peng, and A. Manthanwar, "Convex Methods in Actuator Placement" in the Proceedings of the American Control Conference, Anchorage, Alaska, vol. 6, pp. 4309-4314, 2002.
- Peng, J. K. and D. J. Chmielewski, "Identifying Sensor Performance Targets from a Systems Perspective" presented at the Annual Meeting of the AIChE, Indianapolis, Indiana, November 2002.
- Chmielewski, D. J. and J. K. Peng, "A Globally Optimal, Dynamic Based, Operating Point Selection Scheme for MPC" presented at the Annual Meeting of the AIChE, Austin, TX, November, 2004.
- Peng, J. K. and D. J. Chmielewski, "The Value of Sensor Networks for Advanced Process Control" presented at the Annual Meeting of the AIChE, Austin, TX, November 2004.
- Peng, J. K. and D. J. Chmielewski, "Optimal Sensor Network Design Using the Minimally Back-Off Operating Point Notion of Profit" in the Proceedings of the American Control Conference, Portland, Oregon, pp.220-224, 2005.
- Chmielewski, D. J. and J. K. Peng, "Covariance Based Hardware Selection for Infinite Dimensional Systems" presented at the Annual Meeting of the AIChE, San Francisco, CA, November 2006.
- Ahluwalia, R. K. and J. K. Peng, "MHtool: Metal-Hydride Hydrogen Storage System Analysis Tool," DOE Metal Hydride Analysis Kick-Off Meeting, 29 Sept. 2005, Washington, DC.
- Ahluwalia, R. K., J. K. Peng, and T. Q. Hua, "System Level Considerations for Hydrogen Storage," Storage Systems Analysis Working Group Meeting, 18 Nov. 2005, Palm Springs, CA.
- Ahluwalia, R. K., J. K. Peng, and T. Q. Hua, "On-Board Storage Systems Analysis," DOE and FreedomCAR & Fuel Partnership Analysis Workshop, 25 Jan. 2006, Washington, DC.
- Ahluwalia, R. K., J. K. Peng, and G. Thomas, "Performance of On-Board Metal-Hydride Hydrogen Storage Systems," Material Research Society (MRS) Meeting, Symposium Z: Hydrogen Storage Technologies, Boston, MA, Nov. 27-30, 2006.
- Ahluwalia, R. K., T. Q. Hua, and J. K. Peng, "On-Board Hydrogen Storage System Using a Liquid Carrier" FreedomCAR and Fuels Partnership Analysis Workshop, Columbia, MD, May 8-9, 2007.
- Ahluwalia, R. K., T. Q. Hua, and J. K. Peng, "On-Board Hydrogen Storage Systems for Liquid Carriers" (invited) MS&T, Detroit, MI, Sept. 16-20, 2007.
- J. K. Peng, A. Manthanwar, and D. J. Chmielewski, "On the Tuning of Predictive Controllers: The Minimally Backed-off Operating Point Selection

Problem,” *Industrial Engineering Chemistry, Research*, 44(20), pp.7814-7822, 2005.

- D. J. Chmielewski and J. K. Peng, “Covariance Based Hardware Selection, Part 1: Full State Information Actuator Selection,” *IEEE Transactions on Control System Technology*, 14(2), pp. 355-361, 2006.
- J. K. Peng and D. J. Chmielewski, “Covariance Based Hardware Selection, Part 2: Simultaneous Sensor and Actuator Selection” *IEEE Transactions on Control System Technology*, 14(2), pp. 362-368, 2006.
- R. K. Ahluwalia, J. K. Peng, and R. Kumar, “System Level Analysis of Hydrogen Storage Options” 2005 DOE Annual Progress Report, pp. 676-682, 2005.
- R. K. Ahluwalia, J. K. Peng, T. Q. Hua, and R. Kumar, “System Level Analysis of Hydrogen Storage Options” 2006 DOE Annual Progress Report, pp.41-546, 2006.
- R. K. Ahluwalia, J. K. Peng, T. Q. Hua, and R. Kumar, “System Level Analysis of Hydrogen Storage Options” 2007 DOE Annual Progress Report, pp.611-615, 2007.
- R. K. Ahluwalia, T. Q. Hua, and J. K. Peng, “Fuel Cycle Efficiencies of Different Automotive On-Board Hydrogen Storage Options” *International Journal of Hydrogen Energy*, 32(15), pp. 3592-3602, 2007.

## **Patents**

- MHtool: Metal-Hydride System Analysis Tool (V.1.0), R. K. Ahluwalia and J. K. Peng.
- FCHtool: Fuel Cycle Analysis of Hydrogen Storage Options (V.1.0 and V.2.0), R. K. Ahluwalia, T. Q. Hua, and J. K. Peng.