ZUYI (JACKY) HUANG

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OBJECTIVE

Seeking a full-time position on Mathematical Modeling for Complex Bio-chemical Reaction Networks / Multivariate Data Analysis

QUALIFICATIONS

- More than 4 years experience in developing and analyzing mathematical models of complex bio-chemical reaction networks
- 10 Journal papers, 1 book chapter, 6 peer-reviewed conference papers, and 7 presentations at international conferences
- Solid skills of using multivariate statistics to identify the patterns or trends in high-throughput experiment data
- Substantial experience to simultaneously work in multiple projects with scientists across multiple laboratories

EDUCATION BACKGROUND

Texas A&M University, College Station, Texas — Aug 2010 (expected)
Ph.D., Chemical Engineering

Tsinghua University, Beijing, P. R. China — Jul 2004
Master of Science, Control & Simulation of Thermal Systems

Tsinghua University, Beijing, P. R. China — Jul 2001
Bachelor of Engineering, Thermal Engineering

RESEARCH EXPERIENCE

Graduate Research Assistant, Advisor: Juergen Hahn — May 2006 ~ Present
Department of Chemical Engineering, Texas A&M University, College Station, Texas
***Dissertation Research* (*5 projects*)**

- Mathematical modeling of complex bio-chemical reaction networks
  - Derived ordinary differential equation (ODEs) models of complex bio-chemical reaction networks that included over one hundred components and parameters
  - Investigated mathematical models using Sensitivity Analysis, and performed Parameter Estimation
  - Facilitated experiment design
- Solution of inverse problems
  - Derived input profiles (e.g. transcription factors) from limited and noisy output profiles
  - Inferred stochastic properties of the input from the distribution information of the output
- Statistical multivariate data analysis
  - Performed image analysis to identify objects from images via Principal Component Analysis and Clustering
  - Reduced noise in images via Wavelet and Mathematical Morphology
  - Developed population balance model for the identified objects
- Fuzzy modeling of signal transduction pathway
  - Used Fuzzy modeling to integrate the qualitative information into linguistic models so that fewer quantitative data are required for modeling
- Model reduction of nonlinear models of signal transduction pathway
  - Performed Sensitivity Analysis and Observability Analysis to determine the structure of reduced models

Sensor network design for chemical process systems

- Determined sensor network structure to obtain the most information with the fewest number of sensors

Graduate Research Assistant — Sep 2001 ~ Jul 2004
Institute of Control & Simulation for Thermal systems, Tsinghua University, Beijing, China
***Thesis Research* (*3 projects*)**

- Gain scheduling control and its application to nonlinear systems
- Investigated DCS control system for circulating fluidized-bed boiler
- Simultaneous identification of system order and parameters from time series data

TEACHING EXPERIENCE

Department of Chemical Engineering, Texas A&M University, College Station, Texas
Teaching Assistant — Sep 2007 ~ Present

- Assisted with Process Dynamics and Control for about 80 students (2008 Fall and 2009 Spring)
- Supervised and trained 4 undergraduate students (including one REU student) in their research (2007 ~ Present)

HONORS & SCHOLARSHIPS

- Deisler Fellowship (awarded to 2 outstanding Ph.D. students in Chemical Engineering) 2009
- AIChE - CAST Division Graduate Travel Grant Award (awarded to 10 students across U.S.A.) 2008
- "Excellent Graduate" and "Excellent Graduate Degree Thesis" of Tsinghua University 2004
- "Dec. 9th" Outstanding Graduate Scholarship of Tsinghua University (*1st Prize*) 2003
- First prize in "Challenge Cup" Students' Scientific and Technological Contest at Tsinghua University 2003
- Jiang Nanxiang Outstanding Undergraduate Scholarship of Tsinghua University (*1st Prize*) 2000

COMPUTER SKILLS

- Language: C++, C, Fortran, R
- Software: MATLAB, Fluent, ANSYS, Aspen

SELECTED PUBLICATIONS

Journal Publications (out of total of 10 since 2006)

Z. Huang and J. Hahn, "Deriving the Concentration Distribution of Transcription Factors by Identifying Individual Cells from Fluorescent Miscroscopy Images," submitted to *Automatica* (2010)

Z. Huang*, C. Moya*, J. Hahn, and A. Jayaraman, "Modeling of Artificial Transcription Factor Dynamics by Solving an Inverse Problem," submitted to *Molecular Biosystems* (2010) (*equal contribution)

C. Moya*, **Z. Huang***, P. Cheng, A. Jayaraman, and J. Hahn, "Investigation of IL-6 and IL-10 Signaling in Steatosis Via Mathematical Modeling," submitted to *IET Systems Biology* (2009) (*equal contribution)

R. Kaunas, **Z. Huang**, and J. Hahn. "A Kinematic Model Coupling Stress Fiber Dynamics with JNK Activation in Response to Matrix Stretching," *Journal of Theoretical Biology*, 264, No. 2, pp. 593-603, 2010

Z. Huang, Y. Chu, and J. Hahn, "Model Simplification Procedure for Signal Transduction Pathway Models: An Application to IL-6 Signaling," *Chemical Engineering Science*, 65, No. 6, pp. 1964-1975, 2010

Z. Huang and J. Hahn. "Fuzzy Modeling of Signal Transduction Networks," *Chemical Engineering Science*, 64, No. 9, pp. 2044-2056, 2009

Z. Huang, F. Senocak, A. Jayaraman, and J. Hahn, "Integrated Modeling and Experimental Approach for Determining Transcription Factor Concentrations from Fluorescent Reporter Profiles," *BMC Systems Biology*, 2 (64), 2008 (Highly Accessed)

Book Chapters

Z. Huang and J. Hahn, "Algorithms for Analysis of Fluorescence Microscopy Images for Studying Signal Transduction Pathways and Computation of Transcription Factor Profiles," *Methods in Bioengineering* (Series Editors: Martin L. Yarmush and Robert S. Langer), Artech House, Boston, Massachusetts, pp.33-56, 2009

Peer-reviewed Conference Papers in Proceedings (out of total of 6 since 2006)

Z. Huang, C. Moya, P. Cheng, A. Jayaraman, and J. Hahn. "In Silico Investigation of IL-6 and IL-10 Signaling in Steatosis," *Proceedings Foundations of Systems Biology in Engineering 2009* (*FOSBE 2009*), Denver, Colorado, pp. 28-31

Z. Huang, F. Senocak, A. Jayaraman, and J. Hahn. "Solution of Inverse Problems for Obtaining Protein Concentrations from Fluorescent Microscopy Images," *Proceedings of the 2009 American Control Conference* (*ACC 2009*), St. Louis, Missouri, pp. 1688-1693

Z. Huang and J. Hahn, "Fuzzy Modeling of Signal Transduction Networks," *Proceedings of the 2008 IFAC World Congress*, Seoul, Korea, pp. 15867-15872 (Invited Presentation)

Z. Huang, Y. Chu, F. Senocak, A. Jayaraman, and J. Hahn, "Model Update of Signal Transduction Pathways in Hepatocytes based upon Sensitivity Analysis," *Proceedings Foundations of Systems Biology 2007* (*FOSBE 2007*), Stuttgart, Germany, pp. 45-50 (Plenary Presentation)

Conference Presentations excluding the ones with proceedings (out of total of 7 since 2006)

Z. Huang, Y. Chu, and J. Hahn. Derivation of Reduced Models for Signal Transduction Pathways Via Sensitivity and Observability Analysis. *AIChE 2009*, Nashville, Tennessee

Z. Huang, F. Senocak, A. Jayaraman, and J. Hahn,"Quantitative Measurement Technique for Transcription Factor Profiles," *AIChE 2008*, Philadelphia, Pennsylvania

Z. Huang and J. Hahn, "Development and comparison of algorithms for analysis of fluorescent images for studying the dynamics of signal transduction pathways," *AIChE 2007*, Salt Lake City, Utah

WORK AUTHORIZATION

Eligible for Practical Training. Visa Status: F1.