Yan Zhang

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Objective

To obtain a full time position that utilizes my strong background in optimization, statistics, modelling and risk assessment.

Education

Carnegie Mellon University Pittsburgh, PA, U.S.A. • PhD candidate, Expected May 2013
Cumulative GPA: 3.84/4.00 • Selected Coursework:

Engineering Advanced Heat and Mass Transfer · Advanced Thermodynamics · Metabolic Engineering · Mathematical Modelling of Environmental Systems · Computer Science for Chemical Engineers · Risk Analysis and Management

Optimization Linear Programming · Nonlinear Programming · Advance Process Systems Engineering · Computational Aspects of the Simplex Algorithm

Statistics Probability and Statistics · Intermediate Statistics · Statistical Machine Learning

Zhejiang University Hangzhou, China • Bachelor of Science in Chemical Engineering, September 2004 - July 2008
Cumulative GPA: 3.90/4.00 • Rank: 5^{th}/116, Honor of *University Outstanding Undergraduate*

Experience

Carnegie Mellon University - Department of Chemical Engineering (2008 - present) ***Research Assistant***

- Built an analytical model for CO_2 underground sequestration with thermodynamics and transport phenomena
- Performed risk analysis with *Monte Carlo* (MC) simulation and developed a computational efficient algorithm to determine MC simulation sample size
- Proposed a new regression algorithm with a *mixed-integer programming* formulation to develop surrogate models for detailed numerical simulations of underground fluid flow
- Formulated a *stochastic programming* problem based on developed surrogate models to design optimal operating regime of CO_2 underground storage under uncertainty
- Integrated machine learning techniques into the framework of a nonlinear optimization algorithm which provides a tool for solving *simulation-based* optimization problems and black-box system
- Compared systematically between the performance of existing *derivative-free optimization* algorithms in solving parameter estimation problems based on historical data and numerical simulations

The Dow Chemical Company - Zhangjiagang, China (Summer 2007) ***Production Engineer Intern***

- Modified process control steps and resolved alarms for blower suction pressure low
- Top 3 engineer summer intern and awarded the *Certification of Achievement* from President of Asia Pacific and Greater China

State Competition of Diethyl ether Production Plant Design (Fall 2007) ***Team Leader***

- Simulated production reactor with Aspen Plus, optimized distillation column sequence and integrated heat exchange network with Aspen Pinch
- Conducted site selection, market evaluation and economic feasibility analysis
- Awarded the *First Prize and Scholarship* among 16 peer teams

Zhejiang University - Department of Chemical Engineering (2007 - 2008) ***Undergraduate Researcher***

- Assisted in research on the droplet formation mechanism of acrylic amide aqueous two-phase polymerization
- Awarded the Honor of *University Excellent Undergraduate Thesis*

Publications and Presentations

- *Y. Zhang*, P. Vouzis and N. V. Sahinidis, GPU simulations for risk assessment in CO_2 geologic sequestration, *Computers and Chemical Engineering*, 35 (8), 2011
- *Y. Zhang* and N. V. Sahinidis, Uncertainty quantification in CO_2 sequestration using surrogate models from polynomial chaos expansion, *Industrial and Engineering Chemistry Research*, DOI: 10.1021/ie300856p, 2012
- 104^{th} Annual Meeting of American Institute of Chemical Engineers (*AIChE*), October 2012, Pittsburgh, PA
- 103^{rd} Annual Meeting of *AIChE*, October 2011, Minneapolis, MN
- 102^{nd} Annual Meeting of *AIChE*, November 2010, Salt Lake City, UT
- 9^{th} Annual Conference on Carbon Capture and Sequestration, May 2010, Pittsburgh, PA
- Energy, Sustainability and Climate Change, February 2010, Gainesville, FL
- 101^{st} Annual Meeting of *AIChE*, November 2009, Nashville, TN

Skills

MATLAB, GAMS, CPLEX, BARON, R, TOUGH2, ASPEN, C/C++, bash scripting and Linux

Activities and Awards

Activities Member of *AIChE* since 2009 • *Teaching assistant*: Mathematical Methods of Chemical Engineering, Unit Operation Laboratory, Product Design and Optimization (2008 - 2010) • Statement of Accomplishment, Machine Learning class from Stanford (2011) • *Selected attendee* to Carbon Capture and Storage Summer School by International Energy Agency, Norway (2010) • Course: Carbon Capture and Storage: Science, Technology, and Policy, MIT (2010) • Volunteer for Office of International Education, Carnegie Mellon (2010) • *Leader* of 2004 Chemical Engineering class • *Leader* of college volunteer organization, over 120 service hours and awarded *Excellent Volunteer* (2006 - 2008)

Awards University Undergraduate Scholarship for top 3% students (twice, 2004-2008) • Merck Scholarship (top 3%, 2007) • Research and Innovation Scholarship (2007) • Mitsui Chemical Scholarship (top 10, 2006) • Petro China Tarim Oilfield Company Scholarship (top 1%, 2006)