

Jie Liu

Curriculum Vitae

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Education

- Aug 2013 – current **PhD candidate in Industrial and Systems Engineering**, *Lehigh University*, Bethlehem, Pennsylvania, USA.
GPA: 4.00/4.00.
- Aug 2011 – Jun 2013 **M.A. in Mathematics**, *University at Buffalo, the State University of New York*, Buffalo, New York, USA.
GPA: 3.81/4.00.
Online Course completed(Coursera): Machine Learning (Stanford University, completed with certificate), Computing for Data Analysis (Johns Hopkins University, completed with certificate with distinction).
- Sep 2007 – Jun 2011 **B.S. in Mathematics and Applied Mathematics**, *Nankai University*, Tianjin, China.
GPA: 85.5/100(overall), 85.3/100(major).

Research Interests

My primary research interests include operation research, optimization, financial engineering, data mining, stochastic modeling and statistical learning.

Research Experience

- Jun 2012 – Aug 2012 **Gaussian Process Modeling for Physics-Based Building Energy Simulations**, *Argonne National Laboratory, Lemont, IL, USA.*
- Supervisor **Victor Zavala**, Assistant Computational Mathematician, Argonne National Laboratory
- Introduction to Argonne Argonne National Laboratory outside Chicago is the **first** science and engineering research national laboratory in the United States, receiving his designation on July 1,1946. It's one of the **top** national laboratories in the U.S.
- Research details **Data mining/processing**
- Sampling methods are used to reduce the data set. Traditional method is the random sampling. Available methods we developed to improve the efficiency of sampling are:
1. Improved k-means: we improve the k-means clustering method by comparing the norms to get appropriate number of samples for simulation.
 2. LHS Norm: Latin Hypercube Sampling (LHS) designs are used to get samples.
- Gaussian Process Modeling**

Gaussian process modeling is a non-parameter, Bayesian-based modeling method used to solve uncertainty problems. Numerical results show a much higher improvement using Gaussian process modeling than using the traditional linear regression model. This modeling method is based on *Machine Learning*.

Others Paper is being modified for submitting by Dr. Victor Zavala

Programming: R and Matlab.

Main reference book: C. E. Rasmussen & C. K. I. Williams, *Gaussian Processes for Machine Learning*, the MIT Press, 2006.

Jan 2012 – May 2012 **A Spectral Method for the Numerical Computation of Differential Equations with Stochastic Conditions**, *University at Buffalo, SUNY, Buffalo, NY, USA*.

Supervisor **Jae-Hun Jung**, Assistant Professor, Department of Mathematics, University at Buffalo, SUNY

Research details Spectral methods are popular in solving differential equations.

- Learned a new spectral method, the generalized polynomial chaos(gPC). Finished the reconstruction of the continuous solution with gPC.
- Progressed on reconstruction of solutions with discontinuity.

Programming: Matlab.

Main reference book: Dongbin Xiu, *Numerical Methods for Stochastic Computations: a spectral method approach*, Princeton University Press, 2010.

Class Projects

Fall 2011 **Modeling for Oil Spill Problems – An Application for the 3-D Random Walk Simulation**.

Oil spill problems are vital problems all over the world. This project focuses on oil diffusion and provides an easy and convenient model based on Brownian motion. The solution from the model can help predict the contaminated area by the spilled oil.

Presentations

August 2, 2012 **Brief Introduction to LHS Design and GP Impelmentation in R**, *Argonne National Laboratory “Symposium features talks by LANS summer students of 2012”*, Lemont, IL, USA.

March 30-31, 2012 **A Spectral Method for the Numerical Computation of Differential Equations with Stochastic Conditions**, *Rensselaer Polytechnic Institute “Applied Math Days”*, Troy, NY, USA.

Teaching Experience

Sep 2013 – current **Grader**, *Department of Industrial and Systems Engineering, Lehigh University*, Bethlehem, PA, USA.

- Helped the professors grade courses ISE 111
- Offered office hours to answer questions from college students

Aug 2011 – May 2013 **Grader**, *Department of Mathematics, University at Buffalo, SUNY*, Buffalo, NY, USA.

- Helped the professors grade courses MTH 141/142, MTH 121, MTH 306, etc.
- Tutored in the Math Help Center to solve all kinds of mathematical problems for students.

Sep 2008 – Jun 2011 **Laboratory Assistant**, *School of Mathematical Sciences, Nankai University, Tianjin, China.*

- Assisted the administer Miss Gao in the administration and registration of the Computer Laboratory.
- Acted as a coordinator between Miss Gao and the faculty.
- Helped the students solve problems regarding computers and mathematical software.

Honors and Grants

Sep 2013 – Aug 2014 **Dean’s Doctoral Assistantship**, *Lehigh University.*

Sep 2011 – May 2013 **Teaching Assistantship**, *University at Buffalo, SUNY.*

Sep 2010 – Jun 2011 **“Three Goods Student”**, *Nankai University.*

Sep 2009 – Jun 2010 **Second Prize of Excellent Undergraduate Scholarship**, *Nankai University.*

Sep 2008 – Jun 2009 **FRANCIS CHEUNG of the Hong Kong Friends Grants**, *Nankai University.*

Jun 2008 **2nd in Nankai University of “Huatai Securities Cup” Index Futures Contest for Students**, *Nankai University.*

Sep 2007 – Jun 2008 **Third Prize of Excellent Undergraduate Scholarship**, *Nankai University.*

Sep 2007 – Jun 2008 **First Prize of National Grants**, *Nankai University.*

Computer Skills

Programming AMPL, CPLEX, MOSEK, Gurobi, R, Matlab, EViews, C, SAS

Math Tools Maple, Mathematica

Operating Systems Mac OS, Windows

Others L^AT_EX, Microsoft Excel, Microsoft Word