

LE CHEN

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EDUCATION

Stanford University

Post-Doctoral Scholar in Mechanical Engineering

January 2015--Current

Iowa State University

Ph.D. in Mechanical Engineering with minor in Statistics

GPA 3.9/4.0

August 2009--December 2013

Southeast University, Nanjing, China

B.S. in Instrument Science and Engineering

GPA 88/100, Rank 1/105

August 2004--June 2008

PAST EXPERIENCE

Research Assistant, IRIS Laboratory, Iowa State University

January 2012--December 2013

Develop an optimization-under-uncertainty framework for wind farm layout optimization using C++

- 1) Conduct sensitivity analysis to identify influential uncertain parameters from three epistemic uncertain parameters: surface roughness, wind shear exponent, and economies-of-scale cost reduction coefficient
- 2) Develop mathematical models for both aleatory and epistemic uncertainties: landowner participation, wind condition, cost model, and noise impact
- 3) Propagate the uncertain parameters through the system using Latin Hypercube Sampling
- 4) Solve the multi-objective optimization problem using Compromise Programming with Chebyshev metric

Research Assistant, Ames National Laboratory

January 2010--December 2011

• Develop a cost-of-energy wind farm layout optimization system model using C++ and Matlab

- 1) Develop a wind farm layout optimization system model with an enhanced levelized cost model, wake loss model, and energy model
- 2) Relax the assumption that a continuous piece of land is available, developing a novel approach that includes a model of landowner participation rates
- 3) Use Genetic Algorithm to solve the non-linear constrained optimization problem, minimizing costs and maximizing power output
- 4) Prove the importance of considering landowners in wind farm layout optimization problem: to identify crucial plots of land; to identify alternate optimal layout scenarios; and, ultimately, to increase the accuracy of predictions of financial viability

Student Mentor, Wind REU Program, Iowa State University

May 2011--August 2011

• Supervise three undergraduates to complete two summer research projects related to Wind Energy

- 1) Investigate the impact of wind farm on crops
- 2) Conduct interviews with wind farm companies and landowners to learn about landowner's decision-making processes in wind farm development project

Data Analyst, IRIS Laboratory, Iowa State University

August 2009--December 2009

• Data analysis for car web advertisements with different cognitive styles using JMP

Research Assistant, RS&C Laboratory, Southeast University, Nanjing, China

December 2007--June 2009

• Develop a novel strain-gauge-based three degree-of-freedom force sensor

- 1) Conduct the finite element analysis for the elastic body of the force sensor using ANSYS
- 2) Design the mechanical structure of the sensor including: elastic body, pedestal, sealing cover and chassis

- 3) Circuit design including: Hilton Bridge Circuit, amplifying circuit, and sampling circuit with USB interface
- 4) USB firmware programming for system initialization, data sampling, and data transmission
- 5) Conduct force-loading experiment to calibrate the force sensor and calculate the errors

Research Assistant, RM&C Laboratory, Southeast University, Nanjing, China October 2006--November 2007

- Develop a three degree-of-freedom remote rehabilitative robot to facilitate stroke patients or disable people by exercising their upper limbs
- Design a friendly human-computer interface and interactive game for the rehabilitative robot using C++

Team Leader, International Mathematical Contest in Modeling, Honorable Mention Prize

Southeast University, Nanjing, China

October 2006--February 2007

- Build models based on the theory of Statistical Physics to solve a Districting Problem, “Gerrymandering”, taking into consideration the population distribution as well as the interest of minority parties and races

HONORS & AWARDS

- Research Excellence Award, Iowa State University, 2013
- Miller Graduate Fellowship, Department of Mechanical Engineering, Iowa State University, 2009 - 2011
- Member, Golden Key International Honor Society, 2010
- Gold Medal Winner, Outstanding Undergraduate Thesis of Jiangsu Province, 2009
- Gold Medal Winner, the Third National Undergraduate Mechanical Innovational Design Competition, China, 2008
- Gold Medal Winner, the Tenth National “Challenge Cup” Competition of Undergraduate’s Science and Technology Works (Tiao Zhan Bei), China, 2007
- Honorable Mention in Mathematical Contest in Modeling (MCM) mainly held by U.S. National Security Agency and Consortium for Mathematics and Its Applications, 2007

PUBLICATIONS

- **Le Chen**, Erin MacDonald, 2014, “A System-Level Cost-of-Energy Wind Farm Layout Optimization with Landowner Modeling”, *Energy Conversion and Management*, 77, pp. 484-494.
- **Le Chen**, Erin MacDonald, 2013, “Effects of Uncertain Land Availability, Wind Shear, and Cost on Wind Farm Layout”, ASME 2013 International Design Engineering Technical Conference & Computers and Information in Engineering Conference (IDETC), August 4-7, Portland, Oregon.
- **Le Chen**, Erin MacDonald, 2012, “Considering Landowner Participation in Wind Farm Layout Optimization”, *Journal of Mechanical Design*, 134(8), 084506.
- **Le Chen**, Erin MacDonald, 2011, “A New Model for Wind Farm Layout Optimization with Landowner Decisions”, ASME International Design Engineering Technical Conference & Computers and Information in Engineering Conference (IDETC), August 28-31, Washington D.C.
- **Le Chen**, Aiguo Song, 2009, “A Novel Three Degree-of-freedom Force Sensor”, published by IEEE Computer Society in the proceedings of the International Conference on Measuring Technology and Mechatronics Automation (ICMTMA), Vol. 1, 77-80.
- **Le Chen**, Aiguo Song, 2008, “Design of a Three Degree-of-freedom Force Sensor”, Undergraduate Thesis, Southwest University. (This thesis won the Gold Medal in the Outstanding Undergraduate Thesis Competition of Jiangsu Province. Only 5 students in Southeast University and 52 students in Jiangsu Province won it.)

TECHNICAL SKILLS

- C/ C++, Matlab, JMP, SAS, DFMA, Solidworks, Protel, Ansys, Labview, Auto CAD