Ying Chen, Ph.D.

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EDUCATION

Ph.D., Industrial Engineering University of Texas at Arlington 2014 - 2017
- Dissertation: "Using Approximate Dynamic Programming to Control an Electric Vehicle Charging Station System", Advisors: Drs. Victoria Chen and Jay Rosenberger

M.S., Industrial Engineering Texas A&M University-Kingsville 2011 - 2013
- Thesis: "Commercial Wind Farm Layout Design and Optimization", Advisors: Drs. Hua Li and Kai Jin

B.S., Electrical Engineering Henan Polytechnic University, China 2007 - 2011

RESEARCH INTESESTS

- **Operations Research**: approximate dynamic programming, combinatorial optimization, genetic algorithm, Markov decision process, optimization, linear programming, non-linear programming, stochastic programming
- **Big Data Analytics**: data-driven design and modeling, energy data analytics, statistics, data mining, machine learning
- **Energy Systems & Management**: power system operations, electricity market design，electric vehicle charging station management, electricity market price forecasting
- **Renewable Energy**: wind farm design and optimization, wind & solar energy forecasting

PROFESSIONAL POSITION

University of Texas at San Antonio, San Antonio, TX, USA 2018/01-present
Postdoctoral Researcher,

University of Nebraska-Lincoln, Lincoln, NE, USA
Postdoctoral Researcher, 2017/09-2017/12

University of Texas at Arlington, Arlington, TX, USA
Graduate Teaching Assistant 2015/08-2017/08
Graduate Research Assistant 2014/08-2015/08

Texas A&M University-Kingsville, Kingsville, TX, USA
Graduate Research Assistant 2011/08-2013/05
Graduate Teaching Assistant 2012/07-2012/12

Henan Polytechnic University, Jiaozuo, Henan, China
Undergraduate Research Assistant 2010/02-2011/03

RESEARCH EXPERIENCE

❖ EPAS/AIS Collaborative Research: Adaptive Design for Controllability of a System of Plug-in Hybrid Electric Vehicle Charging Stations. Funded by NSF. PI: Victoria Chen; Co-PI: Jay Rosenberger, Wei-Jen Lee

- **Infinite Horizon Approximate Dynamic Programming Using Computer Experiments**
  - + Developed an innovative infinite horizon ADP algorithm from the statistics perspective to overcome the curse of dimensionality in the continuous state space.
  - + Application on nine dimensional stochastic inventory forecasting problem.
  - + Proposed a new infinite horizon ADP stopping criterion-45 degree line correspondence.
- **Support Vector Regression Value Function Approximation for Infinite Horizon Stochastic Dynamic Programming**
  - + Used Support Vector Regression (SVR) to approximate the value function of a nine dimensional inventory forecasting problem.
  - + Compared the performance of multivariate adaptive regression splines (MARS) and SVR in value function approximation.
  - + Investigated extrapolation of value function built by SVR with RBF kernel and MARS.
  - + Specified the 45 degree line correspondence with a new algorithm.
- **Approximate Dynamic Programming for Control of a System of Electric Vehicle Charging Stations**
  - + Formulated a large-scale EV charging station control system as a Markov decision process problem.
  - + Developed the state transition model of EV problem through SVR.
  - + Applied the developed DACE based infinite horizon ADP algorithm to control this system.
- **Impact of Multicollinearity in the State Space of Electric Vehicle Charging Station Control Problem**
  - + Used data mining techniques such as stepwise regression, principle component analysis and partial least square regression to solve the multicollinearity in the state space.
  - + Proposed a new algorithm to handle the multicollinearity in the state space of an infinite horizon EV problem.
  - + Compared the performances of value functions built in the orthogonal state space and in the correlated state space.

❖ Investigation and Analysis of the Overall Sustainability for Onshore and Offshore Wind Farms, Funded by TAMUK & HP

- + Wind farm layout optimization using different hub height wind turbines
- + Development of commercial wind farm layout optimization
- + Nested genetic algorithm (GA) development and application
- + Commercial wind turbines installation cost model development
- + Multi-objective GA application and research on irregular shape wind farm

TEACHING EXPERIENCE

- Assisted professors to teach IE 5301 Advanced Operations Research (graduate level), grade homework and exams (in-class and online).
- Lecturer of AutoCAD/Solidworks lab course (undergraduate level)
- Lecturer of Summer Camp for High School Students (high-school level)

HONORS, FELLOWSHIPS AND Awards

+ 2017 NSF Travel Award to Big Data Neuroscience Workshop 2017
+ 2016 Carrizo Gas & oil Fellowship in University of Texas at Arlington

+ 2015 Carrizo Gas & oil Fellowship in University of Texas at Arlington
+ 2014 Carrizo Gas & oil Fellowship in University of Texas at Arlington
+ 2014 2013 Frank H. Dotterweich College of Engineering Dean's Award-Outstanding Research Paper
+ 2013 Excellent Graduate Student Award in Texas A&M University-Kingsville
+ 2012 International Education Exchange Fund Scholarship in Texas A&M University-Kingsville
+ 2011 Competitive Scholarship in Texas A&M University-Kingsville
+ 2010 First Prize on the Mathematical Modeling Paper
+ 2010 Outstanding Student Scholarship (3rd)
+ 2008 Third Prize on the Electronic Science and Technology Competition held by HPU
+ 2007 Excellent Member of Communist Youth League in the College of Electrical Engineering

PEER-REVIEWED PUBLICATIONS

(1) Bancha Ariyajunya, **Ying Chen***, Victoria C. P. Chen, Seoung Bum Kim. Data Mining for State Space Orthogonalization in Adaptive Dynamic Programming. *Expert Systems with Applications*, 76(15): 49-58, 2017. (*Corresponding Author)

(2) **Ying Chen**, Hua Li, Bang He, Pengcheng Wang, Kai Jin. Multi-objective Genetic Algorithm Based Innovative Wind Farm Layout Optimization Method. *Energy Conversion and Management*, 105(15): 1318-1327, 2015.

(3) **Ying Chen**, Hua Li, Kai Jin, Yoursi Elkassabgi. Investigating the Possibility of Using Different Hub Height Wind Turbines in a Wind Farm. *International Journal of Sustainable Energy*, 36(2):142-150, 2017.

(4) **Ying Chen**, Hua Li, Kai Jin, Qing Song. Wind Farm Layout Optimization Using Genetic Algorithm with Different Hub Height Wind Turbines. *Energy Conversion and Management*, 70: 56-65, 2013 ---- ***Featured as the key scientific journal paper by the website of Renewable Energy Global Innovations***

(5) Hua Li, Kai Jin, Bang He, **Ying Chen**, Hollow Structure Snap-Fit Design Embedded with Shape Memory Polymer Sheet. *CIRP Annals-Manufacturing Technology*, 61(1): 31-34, 2012.

(6) Hua Li, Javier Ortega, **Ying Chen**, Bang He, Kai Jin. Study of Shape Memory Polymers Snap-Fit for Disassembly. *Assembly Automation*, 32(3): 245 – 250, 2012.

(7) En Wang, Haizhu Yang, **Ying Chen**, Guanghua Chen, Experimental Study of 700W Stand-alone Photovoltaic Power Generation System, *Chinese Journal of Power Sources*, pp 85-88, 2011.

TECHNICAL REPORT

(1) **Ying Chen**, Feng Liu, Asama Kulvanitchaiyanunt, Victoria Chen, Jay Rosenberger. Infinite Horizon Approximate Dynamic Programming Using Computer Experiments. *COSMOS 17-02*. University of Texas at Arlington.

(2) **Ying Chen**, Feng Liu, Victoria Chen, Jay Rosenberger. Support Vector Regression Value Function Approximation For Infinite Horizon Stochastic Dynamic Programming. *COSMOS 17-03*. University of Texas at Arlington.

(3) **Ying Chen,** Jay Rosenberger, Victoria Chen, Wei-Jen Lee. Approximate Dynamic Programming for Control of a System of Electric Vehicle Charging Stations. *COSMOS 17-06*. University of Texas at Arlington.

MNANUSCRIPTS UNDER REVIEW OR IN PREPARATION

(1) **Ying Chen**, Feng Liu, Asama Kulvanitchaiyanunt, Victoria Chen, Jay Rosenberger. Infinite Horizon Approximate Dynamic Programming Using Design and Analysis of Computer Experiments. *Operations Reserach*. (in preparation)

(2) **Ying Chen**, Victoria Chen, Jay Rosenberger, Wei-Jen Lee. Approximate Dynamic Programming for Control of a System of Electric Vehicle Charging Stations. *IISE Transactions*. (will submit for second round review)

(3) Bancha Ariyajunya, **Ying Chen**, Victoria Chen, Seoung Bum Kim, Jay Rosenberger. Adaptive Dynamic Programming for High-Dimensional Multicollinear State Spaces. *Operations Research*. (in preparation)

(4) **Ying Chen**, Victoria Chen, Jay Rosenberger. Impact of Multicollinearity in the State Space of Electric Vehicle Charging Station Control Problem. *European Journal of Operational Research*. (in preparation)

(5) Ukesh Chawal, **Ying Chen**, Victoria Chen, Jay Rosenberger. A Two-Stage Design and Analysis of Computer Experiments Approach for Optimizing a System of Electric Vehicle Charging Stations. *Operations Research*. (in preparation)

POSTERS AND PRESENTATIONS

(1) **Ying Chen**, Chen, V., Rosenberger, J., Lee, W. Using Approximate Dynamic Programming to Control an Electric Vehicle Charging Station System. Oct. 2017, INFORMS, Houston, Texas.

(2) **Ying Chen**, Chen, V., Rosenberger, J., Sarikprueck, P., Lee, W. Challenges in State Transition Modeling for a System Of Electric Vehicle Charging Stations. Nov. 2016, INFORMS, Nashville, Tennessee.

(3) Chen, V., Ariyajunya, B., **Ying Chen**., Kim, S. Multicollinearity in State Transition Modeling. Nov. 2016, INFORMS, Nashville, Tennessee.

(4) **Ying Chen**, Li, H., Jin, K., Wind Farm Layout Design using Genetic Algorithm, 10th Annual Pathways Student Research Symposium. Nov. 2012, Galveston, Texas

(5) **Ying Chen**, Li, H., Jin, K., Wind Farm Layout Optimization using Genetic Algorithm with Different Hub Height Wind Turbines, 4th Javelina Research Symposium, Oct. 2012. Kingsville, Texas.

(6) **Ying Chen**, Song, Q., Li, H., Jin, K., Preliminary Investigation of Different Hub Height Wind Turbines Applied in an Onshore Wind Farm, Graduate Students' Research Poster Competition. Apr. 2012. Kingsville, Texas.

(7) Ramos, C.A., **Ying Chen**, Li, H., Jin, K., Factorial Analysis of Selected Factors Affecting Onshore Wind Farm Energy Output, 9th Annual Pathways Student Research Symposium. Nov. 2011. College Station, Texas.

CORE COUSES AND PROFESSIONAL SKILLS

Operations Research, Data Mining & Analytics, Applied Regression and Analysis, Design of Experiment, Dynamic Programming, Combinatorial Optimization, Linear Regression and Analysis, Decision Analysis, Supply Chain Management, Inventory Management; MATLAB, Python, SAS, Minitab, R, CPLEX, Lindo/Lingo.

RESEARCH GRANTS

- ❖ NSF Funding Application Proposal: Real-Time Dynamic Optimal Demand Management for the Future Transactive Energy Market (Pending)
  + My role is to write the literature review and participate in the discussion of model creation.

LIST OF REFERENCES

Professor: Victoria Chen
Email: vchen@uta.edu
Department of Industrial Engineering
University of Texas at Arlington

Professor: Jay Rosenberger
Email:jrosenbe@uta.edu
Department of Industrial Engineering
University of Texas at Arlington

Professor: Wei-Jen Lee
Email:wlee@uta.edu
Department of Electrical Engineering
University of Texas at Arlington