Zichang He

zichanghe@ucsb.edu · Homepage · (805)259-5216

Education

University of California, Santa Barbara (UCSB), CA, USA — Sep. 2018 – present

Pursing Ph.D. in *Electrical and Computer Engineering*, *GPA*: 3.91/4.0;

Northwestern Polytechnical University (NWPU), Xi'an, China — Sep. 2014 – Jun. 2018

B.Eng. in *Detection, Guidance and Control Technology*

Research Experiences

Uncertainty & Data Analysis Lab at UCSB — Sep. 2018 – present

Graduate Research Assistant, Supervisor: Prof. Zheng Zhang

Research Interests: Uncertainty Quantification (UQ); Tensor learning
Aim to develop general UQ and tensor data analysis techniques, and apply them to various applications including machine learning, design automation, control systems, medical imaging and so on.

- Designed an efficient UQ framework for computer architecture based on mixed-integer programming: speed up 100x than Monte Carlo.
- Proposed a compact tensor regression model for high-dimensional UQ problem: lead to linear complexity on dimension.
- Proposed an active tensor learning framework for efficient undersampled MRI reconstruction.
- Solved polynomial-type chance constraint programming for Photonic IC design under uncertainty with a tighter constraint approximation.

Intelligent Information Processing Lab at NWPU — Sep. 2015 – Jun. 2018

Undergraduate Research Assistant, Supervisors: Prof. Wen Jiang & Prof. Yong Deng

Research interests: Uncertainty Analysis; Information Fusion; Quantum Decision Theory.

- Proposed evidential and quantum frameworks to model decision making process, which can explain lots of paradoxes in the classical probability theory.
- Proposed effective uncertainty representation models to solve information fusion and decision making problems under epistemic uncertainty.

The Hong Kong Polytechnic University — Jul. 2017 – Aug. 2017

Summer Research Intern, Supervisor: Prof. Felix T.S. Chan

Publications [Google Scholar]

- **Z. He** and Z. Zhang, "When chance constraint meets polynomial: a surrogate-assisted yield-aware optimization", *In preparation*.
- **Z. He** and Z. Zhang, "Tensor Regression: A New Framework for High-Dimensional Uncertainty Quantification with Rank Determination and Adaptive Sampling", *In preparation*.
- **Z. He**, B. Zhao and Z. Zhang, "Tensor completion with active sampling for high-dimensional MRI reconstruction", submitted.
- **Z. He** and Z. Zhang, "High-dimensional uncertainty quantification via active and rank-adaptive tensor regression", *IEEE Electrical Performance of Electronic Packaging and Systems (EPEPS)*, San Jose, CA, Oct. 2020. (Best Student Paper)
- **Z. He**, W. Cui, C. Cui, T. Sherwood and Z. Zhang, "Efficient uncertainty modeling for system design via mixed integer programming", *International Conf. Computer Aided Design (ICCAD)*, Westminster, CO, Nov. 2019 (acceptance rate 23.8%)

- **Z. He**, F.T.S. Chan, and W. Jiang, "A quantum framework for modelling subjectivity in multi-attribute group decision making", *Computers & Industrial Engineering*, 124 (2018): 560-572.
- **Z. He** and W. Jiang, "An evidential Markov decision making model", *Information Sciences*, 467 (2018): 357-372.
- **Z. He** and W. Jiang, "An evidential dynamical model to explain the interference effects of categorization on decision making results", *Knowledge-Based Systems*, 150 (2018): 139-149.
- **Z. He**, W. Jiang. and F.T.S. Chan, "Evidential supplier selection based on interval data fusion", *International Journal of Fuzzy Systems*, 20 (2018): 1159-1171.
- **Z. He** and W. Jiang, "A new belief Markov chain model and its application in inventory prediction", *International Journal of Production Research*, 56 (2018): 2800-2817.
- W. Jiang, Y. Cao, L. Yang and **Z. He**, "A Time-space domain information fusion method for specific emitter identification based on Dempster-Shafer evidence theory", *Sensors* 17 (9) (2017): 1972.
- Y. Tang, D. Zhou, **Z. He** and S. Xu, "An improved belief entropy-based uncertainty management approach for sensor data fusion", *International Journal of Distributed Sensor Networks*, 13(7) (2017): 1550147717718497.
- **Z. He** and W. Jiang, "Quantum mechanical approach to modelling reliability of sensor reports", *IEEE Sensors Letters*, 1 (2017): 1-4.
- Y. Tang, D. Zhou, S. Xu and **Z. He**, "A weighted belief entropy-based uncertainty measure for multi-sensor data fusion", *Sensors*, 17 (4) (2017): 928.

Teaching & Talks

- Teaching assistant of *ECE 15A* (Foundations of Logic Design), UCSB — Winter 2020
- Teaching assistant of *ECE 139* (Probability & Statistics), UCSB — Spring 2019
- Conference talk on *ICCAD*, Westminster, CO, USA — Nov. 2019
- Conference talk on *8th China Information Fusion Conference*, Xi'an, China — Jul. 2017

Selected Honors & Awards

- Best student paper at IEEE EPEPS conference — 2020
- Outstanding Teaching Assistant award in Department of ECE, UCSB — 2020
- Graduate Fellowship in Department of ECE, UCSB — 2018
- The NWPU Special Scholarship of Yajun Wu and Aviation Industry Corporation of China (top 3%) — 2016, 2017
- Meritorious Winner in Interdisciplinary Contest in Modeling (awarded by COMAP) — 2016

Others

Programming Skills: Python, Matlab, C, C++, R, Mathematica, Keil, LaTex, etc.
Independent reviewer of journals:

- *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*
- *IEEE Transactions on Cybernetics*
- *Information Sciences*
- *Computers & Industrial Engineering*
- *Science China Information Sciences*

Graduate Courses: Linear Systems, Machine Learning, Convex Optimization; Optimal Estimation and Detection, Scientific Computing, Matrix & Tensor Analysis, Game Theory, etc.