WEN SHEN

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Research Interests

I am generally interested in Multi-Agent Systems, Algorithmic Game Theory, Robust Optimization, and Reinforcement Learning. My research is primarily driven by answering the following overarching question:
How can we design effective incentive mechanisms/information structures/learning algorithms to help stakeholders make quality decisions that are robust and resilient in the presence of uncertainty and strategic behavior?
I believe solutions to this problem can help us gain insights into how to tackle some of the most pressing social challenges: traffic congestion, climate change, epidemics, misinformation propagation, and cyber attacks.

Education

University of California, Irvine **Irvine, CA, USA**
Ph.D in Information and Computer Science *06/2019*
- Dissertation: *Beyond Nash Equilibrium: Mechanism Design with Thresholding Agents.*
- Committee: Dr. Cristina Lopes (chair), Dr. Amelia Regan, Dr. David Redmiles

Masdar Institute of Science and Technology **Abu Dhabi, UAE**
M.S. in Computing and Information Science *06/2013*
- Thesis: *Regulating Self-Adaptive Multi-Agent Systems with Real-Time Interventions.*
- Committee: Dr. Jacob Crandall (chair), Dr. Iyad Rahwan, and Dr. Zeyar Aung

Northwestern Polytechnical University **Xi'an, China**
B.E. in Software Engineering (with distinction) *07/2009*
- Thesis: *A Spam Filtering System using Naïve Bayes.*

Professional Experience

Tulane University **New Orleans, LA, USA**
Postdoctoral Fellow *2019 - Current*
- NSF Project : *Towards Robust Moving Target Defense: A Game Theoretic and Learning Approach*

University of California, Irvine **Irvine, CA, USA**
Research Assistant *2014 - 2019*
- NSF Project: *An Aspect-Oriented Approach to Large-Scale Urban Simulations*

Masdar Institute of Science and Technology **Abu Dhabi, UAE**
Research Engineer *2013 - 2014*
- Abu Dhabi Executive Council Project: *Monitoring and Predictive Maintenance of Buildings and Building Systems*

Masdar Institute of Science and Technology **Abu Dhabi, UAE**
Research Assistant *2011 - 2013*
- Siemens Project: *Managing Real-Time Interventions in Smart Buildings*

Shenzhen Comtop Information Technology Co. Ltd. **Shenzhen, China**
Software Engineer *2009-2010*

Working Manuscripts

1. W. Shen, Z. Zheng: *Byzantine-Resilient Multi-Agent Projected Subgradient Method* (Under review).
2. W. Shen, H. Li, Z. Zheng: *Learning to Attack Distributionally Robust Federated Learning* (Under review).
3. N. Jin, Y. Zeng, X. Ma, W. Shen, K. Yan: *Hour-Ahead Air Quality Forecasting with Hybrid LSTM Neural Network Framework* (Under review).

Refereed Conference Papers

In CS, conferences are the primary venues for scientific publications.

Impact: h-index = 10, citations = 430+ as of 08/2020, Google Scholar: https://goo.gl/qaXQQR

4. H. Li, W. Shen, and Z. Zheng: *Spatial-Temporal Moving Target Defense: A Markov Stackelberg Game Model.* In Proc. of the 19th Intl. Conf. on Autonomous Agents and Multi-Agent Systems (**AAMAS 2020**).
5. W. Shen, R. Achar, C.V. Lopes: *A Simulation Analysis of Large Contests with Thresholding Agents.* In Proc. of the 2019 Winter Simulation Conference (**WSC 2019**).
6. W. Shen, Y. Feng, C. V. Lopes: *Multi-Winner Contests for Strategic Diffusion in Social Networks.* In Proc. of the 33rd AAAI Conf. on Artificial Intelligence (**AAAI 2019**).
7. W. Shen, R. Achar, C. V. Lopes: *Toward Understanding the Impact of User Participation in Autonomous Ridesharing Systems.* In Proc. of the 2018 Winter Simulation Conference (**WSC 2018**).
8. W. Shen, J.W. Crandall, K. Yan, C.V. Lopes: *Information Design in Crowdfunding under Thresholding Policies.* In Proc. of the 17th Intl. Conf. on Autonomous Agents and Multi-Agent Systems (**AAMAS 2018**).
9. W. Shen, A. A. Khemiri, A. Almehrezi, W.A. Enezi, I. Rahwan, J.W. Crandall: *Regulating Highly Automated Robot Ecologies: Insights from Three User Studies.* In Proc. of Intl. Conf. on Human-Agent Interaction (**HAI 2017**). **Winner of Best Student Paper Award**. Selected Media: *Heise online.*
10. W. Shen, C.V. Lopes, J.W. Crandall: *An Online Mechanism for Ridesharing in Autonomous Mobility-on-Demand Systems.* In Proc. of the 25th Intl. Joint Conf. on Artificial Intelligence (**IJCAI 2016**).
11. W. Shen, C. V. Lopes: *Managing Autonomous Mobility on Demand Systems for Better Passenger Experience.* In Proc. of the 18th Conf. on Principles and Practice of Multi-Agent Systems (**PRIMA 2015**).
12. W. Shen, V. Babushkin, Z. Aung, W.L. Woon: *An Ensemble Model for Day-ahead Electricity Demand Time Series Forecasting.* In Proc. of ACM Intl. Conf. on Future Energy Systems (**ACM *e-Energy 2013***).

Refereed Journal Articles

13. K. Yan, J. Huang, W. Shen, Z. Ji: *Unsupervised learning for fault detection and diagnosis of air handling units.* **Energy and Buildings**, 2020.
14. K. Yan, W. Shen, H. Lu and Q. Jin: *Emerging Privacy Issues and Solutions in Cyber-Enabled Sharing Services: From Multiple Perspectives.* **IEEE Access**, 2019.
15. K. Yan, L. Ma, Y Dai, W. Shen, Z. Ji: *Cost-sensitive and Sequential Feature Selection for Chiller Fault Detection and Diagnosis.* **International Journal of Refrigeration**, Vol. 86 (2018), pp. 401-409.
16. K. Yan, Z. Ji, H. Lu, J. Huang, W. Shen, Y. Xue: *Fast and Accurate Classification of Time Series Data using Extended ELM: Application in Fault Diagnosis of Air Handling Units.* **IEEE Transactions on Systems, Man and Cybernetics: Systems**, Vol. PP (2017), Issue 99, pp. 1-8.
17. K. Yan, Z. Ji, W. Shen: *Online Fault Detection Methods for Chillers Combining Extended Kalman Filter and Recursive One-class SVM.* **Neurocomputing**, Vol.228 (2017), pp. 205-212.
18. T. Mulumba, A. Afshari, K. Yan, W. Shen, L. K. Norford: *Robust Model-based Fault Diagnosis for Air Handling Units.* **Energy and Buildings**, Vol.86(2015), pp. 698-707.
19. K. Yan, W. Shen, T. Mulumba, A. Afshari: *ARX Model Based Fault Detection and Diagnosis for Chillers using Support Vector Machines.* **Energy and Buildings**, vol.81(2014), pp. 287-295.
20. W. Zheng, W. Shen, Y. Zhang: *Implementing Spam Filter by Improving Naïve Bayesian Algorithm.* **Journal of Northwestern Polytechnical University**, vol.28, no.4, pp. 622–627, 2010.

Technical Reports

21. W. Shen: *Beyond Nash Equilibrium: Mechanism Design with Thresholding Agents.* PhD Dissertation, University of California, Irvine, June 2019.
22. B. Quadros, R. Kadam, D. Lavaniya, M. Mukhtar, K., Saxena, W. Shen, A. Kobsa: *Dashbell: A Low-cost Smart Doorbell System for Home Use.* (**PerCom WiP 2016**, accepted).
23. W. Shen: *Regulating Self-Adaptive Multi-Agent Systems with Real-Time Interventions.* Master Thesis, Masdar Institute of Science and Technology, June 2013.

Teaching

Mentor, Henger Li, PhD student at Tulane University, 2019
Reader, ICS5 - Global Disruption and Information Technology, Spring 2019
Mentor, Pratik Shetty (M.S. at UCI, Now a software engineer at Microsoft), 2018
Reader, ICS45J - Programming In Java, Spring 2018, Fall 2018, Winter 2018
Assistant, INF295 - Distributed Interactive Simulation, Spring 2016
Reader, INF124 - Internet Applications Engineering, Spring 2015
Reader, INF225/CS221 - Information Retrieval, Winter 2015
Reader, INF43 - Introduction to Software Engineering, Fall 2014

Honors and Awards

Student Travel Grant, Bren School of ICS, University of California, Irvine *2019*
Student Travel Award, International Conference on Autonomous Agents and Multiagent Systems *2018*
Best Student Paper Award, International Conference on Human-Agent Interaction *2017*
Chair's Award, Department of Informatics, University of California, Irvine *2014*
Student Travel Grant (US$2,500), Masdar Institute of Science and Technology *2013*
Outstanding Bachelor Thesis Award, Northwestern Polytechnical University *2009*
National Endeavor Scholarship, Ministry of Education of China *2008*
Academic Excellence Scholarship, Northwestern Polytechnical University *2006-2008*

Academic Service

Conference Program Committee/Reviewer:
International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2021)
AAAI Conference on Artificial Intelligence (AAAI 2021)
International Conference on Learning and Representations (ICLR 2021)
Annual Conference on Neural Information Processing Systems (NeurIPS 2020)
International Joint Conferences on Artifical Intelligence (IJCAI 2020)
Winter Simulation Conference 2020 (WSC 2020)
International AAAI Conference on Web and Social Media (ICWSM 2020)
ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2019)
ACM/IEEE International Conference on Human-Robot Interaction (HRI 2016-2019)
International Conference on Human-Agent Interaction (HAI 2017)
ACM CHI Conference on Human Factors in Computing Systems (CHI 2017)
Journal Reviewer:
Simulation Modelling Practice and Theory 2020
Journal of Building Engineering 2020
IEEE Transactions on Industrial Informatics, 2020
International Journal of Refrigeration, 2020
Simulation Modelling Practice and Theory 2019
World Wide Web (WWW) 2019
Journal of Urban Technology 2018
IEEE Access 2018
Applied Thermal Engineering 2018
Transportation Science 2017
IEEE Transactions on Systems, Man, and Cybernetics: Systems 2017, 2020
International Journal of Electrical Power & Energy Systems 2013

Invited Talks

Incentives, Information, and Learning for Social Good, Xi'an Jiao Tong University, 09/2020
Incentives, Information, and Learning for Social Good, Sun-Yat Sen University, 06/2020
Beyond Nash Equilibrium: Mechanism Design with Thresholding Agents, Tulane University, 09/2019
Beyond Nash Equilibrium: Mechanism Design with Thresholding Agents, University of Vriginia, 04/2019
Beyond Nash Equilibrium: Mechanism Design with Thresholding Agents, Carnegie Mellon University, 04/2019
An Online Mechanism for Ridesharing in Autonomous Mobility-on-Demand Systems, University of California, Irvine, 10/2016
Regulating Highly Automated Robot Ecologies, Masdar Institute, 03/2014

References

Available upon request