

Yi Ouyang

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RESEARCH INTERESTS

Cyber-physical systems	Communication systems, queuing networks, networked control systems, autonomous vehicles, transportation systems, Internet of things.
Dynamic decision-making	Reinforcement learning, multi-armed bandits, dynamic scheduling, stochastic control, decentralized control, team theory.
Game theory	Dynamic stochastic games, mechanism design, electronic commerce.

EDUCATION

University of Michigan, Ann Arbor, MI	Aug. 2010 to Dec. 2015
Ph.D. in Electrical Engineering: Systems	
<i>Dissertation: On the interaction of information and decisions in dynamic networked systems</i>	
<i>Advisor: Prof. Demosthenis Teneketzis</i>	
M.S. in Electrical Engineering: Systems	
National Taiwan University, Taipei, Taiwan	Sep. 2005 to June 2009
B.S. in Electrical Engineering	
B.S. in Mathematics	

EXPERIENCE

University of Southern California, Los Angeles, CA	Jan. 2016 to present
<i>Postdoctoral Researcher</i>	<i>Supervisors: Prof. Rahul Jain and Prof. Ashutosh Nayyar</i>
<ul style="list-style-type: none">• Developed learning and optimization methods for stochastic dynamic systems.• Designed optimal decentralized controllers for systems connected with unreliable communication.	
University of Michigan, Ann Arbor, MI	Aug. 2011 to Dec. 2015
<i>Graduate Student Research Assistant</i>	<i>Supervisor: Prof. Demosthenis Teneketzis</i>
<ul style="list-style-type: none">• Developed and implemented adaptive sensing algorithms.• Developed optimal routing algorithms for decentralized queueing systems.• Designed efficient multiple access protocols for wireless communication.• Analyzed strategic behaviors using a dynamic game framework.	
National Taiwan University, Taipei, Taiwan	Sep. 2006 to June 2008
<i>Research Assistant</i>	<i>Supervisor: Prof. Jiun-Ming Chen</i>
<ul style="list-style-type: none">• Parallelized the General Number Field Sieve (GNFS) algorithm to factor modulus in RSA cryptosystem.	

AWARDS

Engineering Graduate Symposium Technical Session Award, University of Michigan, 2012.

Departmental Fellowship, EECS, University of Michigan, 2010.

Government Scholarship to Study Abroad, Ministry of Education, Taiwan, 2010.

Excellent Teaching Assistant, National Taiwan University, 2008.

Silver Medal, the International Mathematical Olympiad (IMO), Mexico, 2005.

PROPOSAL WRITING EXPERIENCE

Contribution to the NSF proposal, PIs: Rahul Jain and Insoon Yang, “CPS: Small: Online Learning-Based Control of Cyber-Physical Systems with Real-Time Adaptation”.

Contribution to the ARO proposal, PIs: Ashutosh Nayyar and Demosthenis Teneketzis, “Stochastic Dynamic Games of Asymmetric Information: A Common Information Approach”.

JOURNAL PUBLICATIONS

Published/Accepted

- [J1] **Y. Ouyang**, H. Tavafoghi and D. Teneketzis, “Dynamic games with asymmetric information: common information based perfect Bayesian equilibria and sequential decomposition”, *IEEE Transactions on Automatic Control*, vol. 62, no. 1, pp. 222-237, Jan. 2017, doi: 10.1109/TAC.2016.2544936.
- [J2] **Y. Ouyang** and D. Teneketzis, “Signaling for decentralized routing in a queueing network”, *Annals of Operations Research*, 2015, doi:10.1007/s10479-015-1850-4.
- [J3] **Y. Ouyang** and D. Teneketzis, “On the optimality of myopic sensing in multi-state channels”, *IEEE Transactions on Information Theory*, vol. 60, no. 1, pp. 681-696, Jan. 2014, doi:10.1109/TIT.2013.2288636.

Submitted

- [J4] S. M. Asghari, **Y. Ouyang** and A. Nayyar, “Optimal Local and Remote Controllers with Unreliable Uplink Channels”, *IEEE Transactions on Automatic Control*, 2016 (submitted).

Working Paper

- [W1] **Y. Ouyang** and D. Teneketzis, “A Common Information-Based Multiple Access Protocol Achieving Full Throughput and Linear Delay”. Available online: arXiv:1506.08417.
- [W2] **Y. Ouyang** and D. Teneketzis, “Decentralized Routing with Bursty Arrivals”.
- [W3] **Y. Ouyang**, S. M. Asghari and A. Nayyar, “Optimal Decentralized Control with Unreliable Communication”.
- [W4] H. Tavafoghi, **Y. Ouyang** and D. Teneketzis, “On Stochastic Dynamic Games with Delayed Sharing Information Structure”.

CONFERENCE PUBLICATIONS

- [C1] **Y. Ouyang**, M. Gagrani and R. Jain, “Control of Unknown Linear Systems with Thompson Sampling”, *Allerton conference on Communication, Control, and Computing (Allerton)*, 2017 (submitted).
- [C2] **Y. Ouyang**, S. M. Asghari and A. Nayyar, “Stochastic Teams with Randomized Information Structures”, *IEEE Conference on Decision and Control (CDC)*, 2017 (accepted).
- [C3] **Y. Ouyang**, S. M. Asghari and A. Nayyar, “Optimal Local and Remote Controllers with Unreliable Communication”, *IEEE Conference on Decision and Control (CDC)*, Dec. 12-14, 2016.
- [C4] H. Tavafoghi, **Y. Ouyang** and D. Teneketzis, “On Stochastic Dynamic Games with Delayed Sharing Information Structure”, *IEEE Conference on Decision and Control (CDC)*, Dec. 12-14, 2016.
- [C5] **Y. Ouyang**, R. Jain and P. Varaiya, “On the Existence of Near-Optimal Fixed Time Control of Traffic Intersection Signals”, *Allerton conference on Communication, Control, and Computing (Allerton)*, Sep. 28-30, 2016 (invited).
- [C6] **Y. Ouyang**, H. Tavafoghi and D. Teneketzis, “Dynamic oligopoly games with private markovian dynamics”, *IEEE Conference on Decision and Control (CDC)*, Dec. 15-18, 2015.

- [C7] **Y. Ouyang** and D. Teneketzis, “A common information-based multiple access protocol achieving full throughput”, *IEEE International Symposium on Information Theory (ISIT)*, June 14-19, 2015.
- [C8] Y. Liu, **Y. Ouyang** and M. Liu, “Optimal Relay Selection with Non-negligible Probing Time”, *IEEE International Conference on Communications (ICC)*, June 8-12, 2015.
- [C9] **Y. Ouyang** and D. Teneketzis, “Balancing through signaling in decentralized routing”, *IEEE Conference on Decision and Control (CDC)*, Dec. 15-17, 2014.
- [C10] **Y. Ouyang** and D. Teneketzis, “A routing problem in a simple queueing system with non-classical information structure”, *Allerton conference on Communication, Control, and Computing (Allerton)*, Oct. 2-4, 2013.
- [C11] **Y. Ouyang** and D. Teneketzis, “On the optimality of a myopic policy in multi-state channel probing”, *Allerton conference on Communication, Control, and Computing (Allerton)*, Oct. 1-5, 2012.
- [C12] **Y. Ouyang**, P.C. Lan, S.Y. Ho, Y.C. Tien, T.W. Lo, P.C. Yeh, “Probabilistic cooperative location estimation in wireless networks”, *IEEE Wireless Communications and Networking Conference (WCNC)*, April 18-21, 2010.
- [C13] **Y. Ouyang**, P.C. Lan, S.Y. Ho, Y.C. Tien, T.W. Lo, P.C. Yeh, “Distributed cooperative location estimation (D-COOLEST) in wireless environments”, *IEEE International Conference on Telecommunications (ICT)*, April 4-7, 2010.
- [C14] J.M. Chen, S.I. Yu, **Y. Ouyang**, P.H. Wang, C.H. Lin, P.Y. Huang, B.Y. Yang, C.S. Lai, “Improved factoring of RSA modulus”, *the 25th Workshop on Combinatorial Mathematics and Computation Theory*, Chung Hua University, Hsinchu Hsien, Taiwan, April 25-26, 2008.

PRESENTATIONS AND POSTERS

Invited Talks

- [T1] Optimal local and remote controllers with unreliable uplink channels, Information Theory and Applications Workshop, San Deigo, CA, Feb. 2017.
- [T2] Dynamic games with asymmetric information: equilibrium concept and sequential decomposition, Northwestern University, Evanston, IL, Sep. 2016.
- [T3] Dynamic games with asymmetric information: equilibrium concept and sequential decomposition, University of Southern California, Los Angeles, CA, Mar. 2016.
- [T4] A common information based multiple access protocol achieving full throughput and linear delay, University of Southern California, Los Angeles, CA, Dec. 2015.
- [T5] A common information based multiple access protocol achieving full throughput and linear delay, National Taiwan University, Taipei, Taiwan, July 2015.
- [T6] On the optimality of myopic sensing in multi-State channels, McGill University, Montreal, Canada, Mar. 2015.
- [T7] Signaling for decentralized routing in a queueing network, Group for Research in Decision Analysis (GERAD), Montreal, Canada, Mar. 2015.
- [T8] Signaling for decentralized routing in a queueing network, National Taiwan University, Taipei, Taiwan, Dec. 2014.

Conference Presentations

- [P1] CDC, Las Vegas, NV, Dec. 12-14, 2016.
- [P2] Allerton, Monticello, IL, Sep. 27-30, 2016.

- [P3] CDC, Osaka, Japan, Dec. 15-18, 2015.
- [P4] ISIT, Hong Kong, June 14-19, 2015.
- [P5] ICC, London, UK, June 8-12, 2015.
- [P6] CDC, Los Angeles, CA, Dec. 15-17, 2014.
- [P7] Allerton, Monticello, IL, Oct. 2-4, 2013.
- [P8] Allerton, Monticello, IL, Oct. 1-5, 2012.

Posters

- [S1] “Signaling for decentralized routing in a queueing network”, Engineering Graduate Symposium, University of Michigan, Nov. 2013.
- [S2] “On the optimality of myopic sensing in multi-state channels”, Engineering Graduate Symposium, University of Michigan, Nov. 2012.

TEACHING EXPERIENCE

University of Michigan

Fall 2014

Graduate Student Instructor, EECS 501: Probability and Random Processes

- Lead two weekly discussion sessions, each with 30 graduate students.
- Design discussion materials and problem sets.
- Hold office hours and review sessions.

National Taiwan University

Sep. 2007 to June 2009

Teaching Assistant, Calculus I, II

- Lead a weekly discussion session with 60 undergraduate students.
- Grade homeworks and assignments.
- Hold office hours.

RELEVANT COURSE WORK

Mathematics	Theory of Probability, Random Processes, Linear Programming, Non-Linear Programming, Functional Analysis, Graph Theory.
EECS	Stochastic Control, Linear Systems Theory, Digital Communications, Information Theory, Source Coding, Electricity Markets.
Economics	Game Theory, Mechanism Design.

PROFESSIONAL SERVICES

Reviewer for:

- IEEE Transactions on Automatic Control
- IEEE Transactions on Control of Network Systems
- IEEE Transactions on Communications
- IEEE Transactions on Information Theory
- Operations Research Letters
- IEEE Conference on Decision and Control (CDC)
- American Control Conference (ACC)

- IEEE International Symposium on Information Theory (ISIT)
- IEEE International Conference on Communications (ICC)
- IEEE Global Communications Conference (Globecom)