Hao Yu

1144 W. 29th St. Apt 204, Los Angeles, CA, 90007
Tel: (213)-379-6501 E-mail: yuhao@usc.edu, eeyuhao@gmail.com
Web: http://www-scf.usc.edu/~yuhao/

RESEARCH

My research interests are in the areas of convex optimization, network optimization (routing and rate control), online learning, machine learning, network coding and multiple-antenna wireless communications.

EDUCATION

University of Southern California, Los Angeles, USA 2012–present

* Ph.D. in Electrical Engineering
  Advisor: Prof. Michael J. Neely
  Thesis Topic: New Lagrangian dual type methods for constrained convex optimization and their applications
* M.A. in Applied Mathematics
  GPA: 4.0/4.0 (A)

The Hong Kong University of Science and Technology, Hong Kong 2008–2011

* M.Phil. in Electronic and Computer Engineering

Xi'an Jiaotong University, Xi'an, China 2004–2008

* B. Eng. in Electrical Engineering

WORKING EXPERIENCES

Qualcomm Research New Jersey, Bridgewater, NJ, USA Summer, 2016
Summer Intern

* Developed new schemes for inter-cell user scheduling an inter-cell interference management in millimeter wave communication for 5G cellular networks.
* Performed C++ and MATLAB simulations for the proposed schemes.

Tencent Holdings Limit, Shenzhen, China, 2011-2012
Software Engineer

* Developed the customer service module and maintained the trade module of PAIPAI (www.paipai.com, now acquired by www.jd.com), an e-commerce website with more than 50 million users.
* Developed a real-time monitoring system to detect hardware or software failures in the trade module of PAIPAI.

PREPRINTS

1. **Hao Yu** and Michael J. Neely, A New Backpressure Algorithm for Joint Rate Control and Routing with Vanishing Utility Optimality Gaps and Finite Queue Lengths, arXiv:1701.04519, 2017 **submitted to IEEE/ACM Transactions on Networking**
2. **Hao Yu** and Michael J. Neely, "A Low Complexity Algorithm with $O(\sqrt{T})$ Regret and Finite Constraint Violations for Online Convex Optimization with Long Term Constraints," arXiv:1604.02218, 2016, **submitted to Journal of Machine Learning Research**.
3. **Hao Yu** and Michael J. Neely, "On the Convergence Time of Dual Subgradient Methods for Strongly Convex Programs," arXiv:1503.06235, 2015, **IEEE Transactions on Automatic Control, under revision**.
4. Xiaohan Wei, **Hao Yu** and Michael J. Neely, "A Probabilistic Sample Path Convergence Time Analysis of Drift-Plus-Penalty Algorithm for Stochastic Optimization," arXiv:1510.02973, 2015, under submission.

JOURNAL PUBLICATIONS

1. **Hao Yu** and Michael J. Neely, "A Simple Parallel Algorithm with an $O(1/t)$ Convergence Rate for General Convex Programs," **SIAM Journal on Optimization**, 27(2), 2017, pp.759-783.
2. **Hao Yu** and Michael J. Neely, "Dynamic Transmit Covariance Design in MIMO Fading Systems With Unknown Channel Distributions and Inaccurate Channel State Information," **IEEE Transactions on Wireless Communications**, to appear, preprint arXiv:1512.08419.
3. **Hao Yu** and Michael J. Neely, "Duality Codes and the Integrality Gap Bound for Index Coding," **IEEE Transactions on Information Theory**, 60(11), Nov. 2014, pp.7256-7268.
4. **Hao Yu** and Vincent K. N. Lau, "Rank-Constrained Schur-Convex Optimization with Multiple Trace/Log-Det Constraints," **IEEE Transactions on Signal Processing**, 59(1), Jan. 2011, pp.304-314.
5. **Hao Yu**, Shunqing Zhang and Vincent K. N. Lau, "Game Theoretical Power Control for Open-Loop Overlaid Network MIMO Systems with Partial Cooperation," **IEEE Transactions on Wireless Communications**, 10(1), Jan. 2011, pp.135-141.

CONFERENCE PUBLICATIONS

1. **Hao Yu** and Michael J. Neely, "A New Backpressure Algorithm for Joint Rate Control and Routing with Vanishing Utility Optimality Gaps and Finite Queue Lengths," Proc. IEEE International Conference on Computer Communications (**INFOCOM 2017**), Atlanta, USA, May 2017 (Acceptance Rate 20.9% = 292/1395).
2. **Hao Yu** and Michael J. Neely, "A Primal-Dual Type Algorithm with the $O(1/t)$ Convergence Rate for Large Scale Constrained Convex Programs," Proc. IEEE Conference on Decision and Control (**CDC 2016**), Las Vegas, USA, Dec. 2016.
3. **Hao Yu** and Michael J. Neely, "Dynamic Power Allocation in MIMO Fading Systems Without Channel Distribution Information," Proc. IEEE International Conference on Computer Communications (**INFOCOM 2016**), San Francisco, USA, Apr. 2016 (Acceptance Rate 18.2% = 300/1644).
4. **Hao Yu** and Michael J. Neely, "On the Convergence Time of the Drift-Plus-Penalty Algorithm for Strongly Convex Programs," Proc. IEEE Conference on Decision and Control (**CDC 2015**), Osaka, Japan, Dec. 2015.
5. **Hao Yu** and Michael J. Neely, "Duality Codes and the Integrality Gap Bound for Index Coding," Proc. Allerton Conference on Communication, Control, and Computing (**Allerton 2013**), Champion, USA, Oct. 2013.
6. **Hao Yu** and Vincent K. N. Lau, "Rank Constrained Schur-Convex Optimization with Multiple Trace/Log-Det Constraints," Proc. IEEE Global Communications Conference (**GLOBECOM 2010**), Miami, USA, Dec. 2010.
7. **Hao Yu** and Vincent K. N. Lau, "Rank-Constrained Transmit Covariance Optimization in MIMO Cognitive Radio Networks", Proc. IEEE International Conference on Wireless Communications and Signal Processing (**WCSP 2010**), Suzhou, China, Oct. 2010.
8. **Hao Yu**, Shunqing Zhang, Vincent K. N. Lau and Xun Yang, "Game Theoretical Power Control for Open-Loop Network MIMO Systems with Partial Cooperation," Proc. IEEE Region 10 Conference (**TENCON 2009**), Singapore, Nov. 2009.

HONORS & AWARDS

Member of the Honor Society of Phi Kappa Phi
INFOCOM Student Travel Grant, 2016, 2017
Postgraduate Scholarship, HKUST, 2008 - 2011
Outstanding Graduate, Xi'an Jiaotong University, 2008

TEACHING (teaching assistant and substitute lecturer)

USC EE553: Network Processor Design and Programming	2017Sp
USC CSCI558L: Internetworking and Distributed Systems Laboratory	2016Fa,2015Fa
USC EE555: Broadband Network Architectures	2016Sp
USC EE550: Design and Analysis of Computer Communication Networks	2015Sp

SELECTED COURSERWORKS

Analysis of Algorithms (CSCI570), Machine Learning (CSCI567)
Information Theory (EE565A&B)
Introduction to Mathematical Statistics (MATH541A&B)
Methods of Statistical Inference (MATH547)

TECHNICAL SKILLS

C/C++, Python, Java, MATLAB, SQL, LaTex

PROFESSIONAL SERVICES

IEEE Student Member
Technical Reviewer

* Reviewer for Journals: IEEE Journal of Selected Areas in Communications, IEEE Transactions on Mobile Computing, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Transactions on Vehicular Technology, IEEE Journal of Selected Topics in Signal Processing, IEEE Signal Processing Letters
* Reviewer for Conferences: Neural Information Processing Systems (NIPS), IEEE International Symposium on Information Theory (ISIT), IEEE Global Communications Conference (GLOBECOM), IEEE International Conference on Communications (ICC), IEEE Wireless Communications and Networking Conference (WCNC), IEEE Vehicular Technology Conference (VTC)