

XUYANG WU

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RESEARCH INTERESTS

- Distributed optimization
- Machine learning
- Asynchronous optimization

EDUCATION AND RESEARCH EXPERIENCE

Postdoctoral Research Fellow in Machine Learning (with Prof. Mikael Johansson) Dec 2020 - Nov 2023
KTH Royal Institute of Technology, Stockholm, Sweden

Ph.D. in Communication and Information Systems Sep 2015 - Jun 2020
University of Chinese Academy of Sciences, China

B.S. in Applied Mathematics Sep 2011 - Jun 2015
NorthWestern Polytechnical University, Xi'an, China

TEACHING AND SERVICE EXPERIENCE

Teaching Assistant of Linear Systems I, II 2016 - 2018

Postgraduate Student Supervision 2021 - present

Hoster of Seminar Series “Curtain Talks”, Digital Futures, Stockholm 2020 - 2022

AWARD

- Excellent Student Award, University of Chinese Academy of Sciences 2017
- Best Student Paper Finalist, IEEE ICCA 2019

PUBLICATIONS

Journal Papers

- **X. Wu** and J. Lu, “Distributed Optimization with Coupling Constraints” *accepted* to IEEE Transactions on Automatic Control (**IEEE TAC**), 2022.
- **X. Wu** and J. Lu, “A Unifying Approximate Method of Multipliers for Distributed Composite Optimization,” *accepted* to IEEE Transactions on Automatic Control (**IEEE TAC**), 2022.
- H. Wei, Z. Qu, **X. Wu**, H. Wang, and J. Lu, “Decentralized Approximate Newton Methods for Convex Optimization on Networked Systems,” IEEE Transactions on Control of Network Systems (**IEEE TCNS**), vol 8, no 3, 2021.
- **X. Wu**, Z. Qu, and J. Lu, “A Second-Order Proximal Algorithm for Consensus Optimization,” IEEE Transactions on Automatic Control (**IEEE TAC**), vol 66, no 4, 2020.
- **X. Wu** and J. Lu, “Distributed Optimization over Time-varying Networks with Minimal Connectivity”, IEEE Control Systems Letters (**IEEE L-CSS**), vol 4, no 3, 2020.
- **X. Wu** and J. Lu, “Fenchel Dual Gradient Methods for Distributed Convex Optimization over Time-Varying Networks,” IEEE Transactions on Automatic Control (**IEEE TAC**), vol 64, no 11, 2019.

Conference Papers

- **X. Wu**, S. Magnusson, H. R. Feyzmahdavian, and M. Johansson, “Delay-Adaptive Step-sizes for Asynchronous Learning,” In Proceeding of the 39th International Conference on Machine Learning (**ICML**), 2022 (*acceptance rate 21%*).
- **X. Wu**, S. Magnusson, H. R. Feyzmahdavian, and M. Johansson, “Optimal Convergence Rates of Totally Asynchronous Optimization,” *accepted to* the 61th IEEE Conference on Decision and Control (**CDC**), 2022.
- **X. Wu**, S. Magnusson, and M. Johansson, “A New Family of Feasible Methods for Distributed Resource Allocation,” In Proceeding of the 60th IEEE Conference on Decision and Control (**CDC**), 2021.
- **X. Wu**, H. Wang and J. Lu, “A Distributed Proximal Primal-Dual Algorithm for Nonsmooth Optimization with Coupling Constraints”, In Proceeding of the 59th IEEE Conference on Decision and Control (**CDC**), 2020.
- **X. Wu** and J. Lu, “Improved Convergence Rates of P-EXTRA for Non-smooth Distributed Optimization”, In Proceeding of the 15th IEEE International Conference on Control & Automation (**ICCA**), 2019 (**best student paper final list**).
- **X. Wu**, K. C. Sou and J. Lu, “Fenchel Dual Gradient Methods Enabling a Smoothing Technique for Nonsmooth Distributed Convex Optimization”, In Proceeding of the 57th IEEE Conference on Decision and Control (**CDC**), 2018.
- H. Wei, Z. Qu, **X. Wu**, H. Wang and J. Lu, “An Approximately-Zero-Gradient-Sum Algorithm for Consensus Optimization”, In Proceeding of the 15th International Conference on Control, Automation, Robotics, and Vision (**ICARCV**), 2018.
- **X. Wu** and J. Lu, “Partially Asynchronous Coordinate Descent Algorithms for Smooth Convex Optimization,” In Proceeding of the 56th IEEE Conference on Decision and Control (**CDC**), 2017.
- **X. Wu** and J. Lu, “A Fenchel Dual Gradient Method for Distributed Convex Optimization over Time-varying Networks,” In Proceeding of the 56th IEEE Conference on Decision and Control (**CDC**), 2017.

Submitted Papers

- **X. Wu**, S. Magnusson, and M. Johansson, “Distributed Safe Resource Allocation using Barrier Functions”, submitted to **Automatica**, 2022 (second round review).
- **X. Wu**, K. C. Sou, and J. Lu, “Fenchel Dual Gradient Methods Enabling a Smoothing Technique for Nonsmooth Distributed Convex Optimization”, submitted to Optimization Methods and Software (**OMS**), 2022 (second round review).
- C. Liu, **X. Wu**, X. Yi, Y. Shi, and K. H. Johansson, “Rate Analysis of Dual Averaging for Nonconvex Distributed Optimization”, submitted to IFAC world congress (**IFAC**), 2022.
- E. Berglund, S. Khirirat, **X. Wu**, S. Magnusson, and M. Johansson, “Revisiting the Curvature-aided IAG: Improved Theory and Reduced Complexity”, submitted to IFAC world congress (**IFAC**), 2022.

Papers in Preparation

- **X. Wu**, C. Liu, K. H. Johansson, S. Magnusson, and M. Johansson, “Delay-tolerant Asynchronous Coordinate Update”, to be submitted to International Conference on Machine Learning (**ICML**) 2023. (manuscript ready, wait for submission site open)
- **X. Wu**, C. Liu, K. H. Johansson, S. Magnusson, and M. Johansson, “Delay-tolerant Asynchronous Distributed Optimization over Networks”, to be submitted to IEEE Transactions on Automatic Control (**IEEE TAC**). (draft, to be formalized)