Shengjun(Daniel) **Zhang**

Research Assistant · Control · Optimization · Statistical Learning

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"There is nothing more practical than a good theory."

Education

UNT (University of North Texas) — *Denton, Texas, U.S.A*

Ph.D. Major in Electrical Engineering — *Jan. 2018 - May 2022*

- Minor in Business Management

NYU (New York University) — *New York, New York, U.S.A*

M.S. in Electrical Engineering — *Jan. 2015 - Jan. 2017*

- Robotic Control

CAU (China Agricultural University) — *Beijing, China*

B.S. in Automation of Honors Program with *Cum Laude* — *Sep. 2010 - Jul. 2014*

- Control Theory

Research Interests

Learning	Statistical Learning, Machine Learning, Reinforcement Learning
Control & Optimization	Control System, Convex Optimization, Non-convex Optimization, Distributed Optimization
Power System	DERs with Transactive Approaches

Skills

Programming	Julia , Python, MATLAB
Languages	Mandarin, English

Work Experience

Pacific Northwest National Laboratory — *Remote*

Research Scientist Intern — *Jun. 2021 - Aug. 2021*

- Optimization and Control Group
- Supervisor: Dr. Ke Ma

Professional Experience

University of North Texas — *Denton, Texas, U.S.A*

Research/Teaching Assistant — *Jan. 2018 - present*

- Optimization, Signal, Control, and Algorithms Research (OSCAR) Laboratory, Department of Electrical Engineering
- Supervisor: Dr. Colleen Bailey & Dr. Tao Yang (Former advisor)

Huazhong University of Science and Technology — *Wuhan, China*

Visiting Researcher — *May 2018 - Jul. 2018*

- Key Laboratory of Image Processing and Intelligent Control of Education Ministry, School of Artificial Intelligence and Automation
- Supervisor: Dr. Ye Yuan

Zhejiang University — *Hangzhou, China*

Visiting Researcher — *Jul. 2018 - Jul. 2018*

- Group of Networked Sensing and Control, College of Control Science and Engineering
- Supervisor: Dr. Junfeng Wu

New York University — *New York, New York, U.S.A*

Research Assistant — *Jan. 2016 - Jul. 2016*

- Control/Robotics Research Laboratory, Tandon School of Engineering
- Supervisor: Dr. Farshad Khorrami

Publications

Journal Articles [9]

Zeroth-order Algorithms for Distributed Stochastic Nonconvex Optimization
Xinlei Yi, Shengjun Zhang, Tao Yang, Karl H Johansson
IFAC Automatica (Provisionally Accepted).
Provisionally Accepted

Communication Compression for Decentralized Nonconvex Optimization
Xinlei Yi, Shengjun Zhang, Tao Yang, Tianyou Chai, Karl H Johansson
IEEE Transactions on Automatic Control (In Submission).
In Submission

Distributed Zeroth-order Stochastic Coordinate Methods
Shengjun Zhang, Yunlong Dong, Dong Xie, Lisha Yao, Colleen P. Bailey, Shengli Fu
IEEE Transactions on Signal Processing (In Submission).
In Submission

Sublinear and Linear Convergence of ADMM for Distributed Nonconvex Optimization
Xinlei Yi, Shengjun Zhang, Tao Yang, Tianyou Chai, Karl H Johansson
IEEE Transactions on Control of Network Systems (Conditionally Accepted).
Conditionally Accepted

A Primal-Dual SGD Algorithm for Distributed Nonconvex Optimization
Xinlei Yi, Shengjun Zhang, Tao Yang, Tianyou Chai, Karl H Johansson
IEEE/CAA Journal of Automatica Sinica (2022).
2022

Variance aware reward smoothing for deep reinforcement learning
Yunlong Dong, Shengjun Zhang, Xing Liu, Yu Zhang, Tan Shen
Neurocomputing 458 (2021) pp. 327–335.
DOI: 10.1016/j.neucom.2021.06.014 — 2021

Event-triggered Distributed Optimization Algorithms (in Chinese)
Tao Yang, Lei Xu, Xinlei Yi, Shengjun Zhang, Ruijuan Chen, Yuzhe Li
ACTA Automatica Sinica 47.x (2021) pp. 1–11.
DOI: 10.16383/j.aas.c200838 — 2021

Linear Convergence of First- and Zeroth-Order Primal-Dual Algorithms for Distributed Nonconvex Optimization
Xinlei Yi, Shengjun Zhang, Tao Yang, Tianyou Chai, Karl H. Johansson
IEEE Transactions on Automatic Control (2021) pp. 1–8.
DOI: 10.1109/TAC.2021.3108501 — 2021

A Magnetic Nanoparticle Based Nucleic Acid Isolation And Purification Instrument for DNA Extraction of Escherichia coli O157: H7
Yahui Chen, Jianhan Lin, Qin Jiang, Qi Chen, Shengjun Zhang, Li Li
Journal of nanoscience and nanotechnology 16.3 (2016) pp. 2296–2300.
DOI: 10.1166/jnn.2016.10933 — 2016

Conference Proceedings [11]

Accelerated Zeroth-order Algorithm for Stochastic Distributed Nonconvex Optimization
Shengjun Zhang, Colleen P. Bailey
2022 American Control Conference (ACC) — *Atlanta, GA, United States*
2022

Event-Triggered Proportional-Integral Algorithms for Distributed Optimization (Invited Session Extended Abstract)
Tao Yang, Lei Xu, Xinlei Yi, Shengjun Zhang, Yuzhe Li
40th Chinese Control Conference (CCC) — *Shanghai, China*
2021

A Primal-Dual Algorithm for Distributed Sparse Principal Component Analysis
Shengjun Zhang, Colleen P. Bailey

2021 IEEE International Conference on Data Science and Computer Application — *Dalian, China*
DOI: 10.1109/ICDSCA53499.2021.9650142 — 2021

Accelerated Primal-Dual Algorithm for Distributed Nonconvex Optimization
Shengjun Zhang, Colleen P. Bailey
2021 IEEE Symposium Series on Computational Intelligence (SSCI) — *Orlando, FL, United States*
DOI: 10.1109/SSCI50451.2021.9660023 — 2021

Convergence Analysis of Nonconvex Distributed Stochastic Zeroth-order Coordinate Method
Shengjun Zhang, Yunlong Dong, Dong Xie, Lisha Yao, Colleen P. Bailey, Shengli Fu
60th IEEE Conference on Decision and Control (CDC) — *Austin, TX, United States*
DOI: 10.1109/CDC45484.2021.9683475 — 2021

Exponential Convergence for Distributed Smooth Optimization Under the Restricted Secant Inequality Condition
Xinlei Yi, Shengjun Zhang, Tao Yang, Tianyou Chai, Karl H Johansson
21st IFAC World Congress — *Berlin, Germany*
DOI: 10.1016/j.ifacol.2020.12.383 — 2020

Linear Convergence for Distributed Optimization Without Strong Convexity
Xinlei Yi, Shengjun Zhang, Tao Yang, Tianyou Chai, Karl H Johansson
59th IEEE Conference on Decision and Control (CDC) — *Jeju Island, Republic of Korea*
DOI: 10.1109/CDC42340.2020.9304381 — 2020

Obstacle Avoidance and Navigation Utilizing Reinforcement Learning with Reward Shaping
Shengjun Zhang, Colleen P. Bailey
SPIE Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications II — *California, United States*
DOI: 10.1117/12.2558212 — 2020

Optimal Control Under Communication Constraints for Multi-agent Unmanned Vehicles
Shengjun Zhang, Colleen P. Bailey
SPIE Artificial Intelligence and Machine Learning in Defense Applications II — *Edinburgh, United Kingdom*
DOI: 10.1117/12.2574176 — 2020

Event-Triggered Control for Consensus of Multi-Agent Systems with Nonlinear Output and Directed Topologies
Xinlei Yi, Shengjun Zhang, Tao Yang, Junfeng Wu, Karl Henrik Johansson
38th Chinese Control Conference (CCC) — *Guangzhou, China*
DOI: 10.23919/ChiCC.2019.8865399 — 2019

Computational Convergence Analysis of Distributed Optimization Algorithms for Directed Graphs
Shengjun Zhang, Xinlei Yi, Jemin George, Tao Yang
15th IEEE International Conference on Control and Automation (ICCA) ***(Best Student Paper Shorten List)*** — *Edinburgh, Scotland*
DOI: 10.1109/ICCA.2019.8899565 — 2019

Honors & Awards

2021	**Student Travel Award**, The 60th IEEE Conference on Decision and Control (CDC)	*Austin, Texas, U.S.A*
2020	**Third Place Graduate Student Poster Competition**, IEEE North Tech SAS	*Denton, Texas, U.S.A*
2019	**IEEE Outstanding Graduate Student**, IEEE local event	*Denton, Texas, U.S.A*
2019	**College of Engeering Dean Tuition Scholarship**, UNT	*Denton, Texas, U.S.A*
2019	**Toulouse Graduate School Scholarship**, UNT	*Denton, Texas, U.S.A*
2018	**College of Engeering Dean Tuition Scholarship**, UNT	*Denton, Texas, U.S.A*
2018	**Toulouse Graduate School Scholarship**, UNT	*Denton, Texas, U.S.A*
2012	**2nd prize**, National Physics Experiment Competition of Colleges	*Beijing, China*

Certifications

2016	**Machine Learning**, Instructor: Andrew Ng, license: NNBCAXYFA2HK.	*Stanford University on Coursera*

Teaching Experiences

Spring '22	**EENG 5810 Digital Communications,** Teaching Assistant	*UNT*
Spring '22	**EENG 3920 Modern Communication System Design Project,** Teaching Assistant	*UNT*
Spring '22	**EENG 3510 Electronics I,** Teaching Assistant	*UNT*
Fall '21	**EENG 3510 Electronics I,** Teaching Assistant	*UNT*
Fall '21	**EENG 3520 Electronics II,** Teaching Assistant	*UNT*
Fall '21	**EENG 3920 Modern Communication System Design Project,** Teaching Assistant	*UNT*
Fall '20	**EENG 5940 Optimization Theory,** Teaching Assistant	*UNT*
Spring '19	**EENG 2620 Signals and Systems,** Teaching Assistant	*UNT*
Fall '18	**EENG 2620 Signals and Systems,** Teaching Assistant	*UNT*
Fall '18	**EENG 5940 Control and Optimization for Power Systems,** Teaching Assistant	*UNT*

Professional Activities

Member	IEEE HKN, IEEE Studnet Member, IEEE Young Professionals
Journal Reviewer	IEEE Transactions on Automatic Control
	IEEE Transactions on Control of Network Systems
	IEEE Transactions on Industrial Electronics
	IEEE Transactions on Neural Networks and Learning Systems
	IET Control Theory and Applications
	Neurocomputing
	Automatica
	International Journal of Robust and Nonlinear Control
Conference Reviewer	Advances in Neural Information Processing Systems (NeurIPS)
	IEEE Conference on Decision and Control (CDC)
	American Control Conference (ACC)
	IEEE International Conference on Control and Automation (ICCA)
	Chinese Control Conference (CCC)
Conference Chair	Co-Chair (Substitute Dr. Tao Yang) of Distributed Optimization and Learning for Networked Systems II at CDC 2021

Mentoring

Kelvin Darden *UNT*

M.S. STUDENT *2018*

- Project on load shedding in Smart Grid.
- First placement: engineer, Oncor Electric Delivery.