



# 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)

PH.D. MAJOR IN ELECTRICAL ENGINEERING

- Minor in Business Management

*Denton, Texas, U.S.A*

*Jan. 2018 - present*

### NYU (New York University)

M.S. IN ELECTRICAL ENGINEERING

- Robotic Control

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

*Jan. 2015 - Jan. 2017*

### CAU (China Agricultural University)

B.S. IN AUTOMATION OF HONORS PROGRAM WITH *Cum Laude*

- Control Theory

*Beijing, China*

*Sep. 2010 - Jul. 2014*

## Research Interests

### Artificial Intelligence

Statistical Learning, Machine Learning, Reinforcement Learning

### Optimization

Convex Optimization, Non-convex Optimization, Distributed Optimization

### Power System

DERs with Transactive Approaches

## Professional Experience

### University of North Texas.

RESEARCH/TEACHING ASSISTANT

- Cyber-Physical Energy System Laboratory, Department of Electrical Engineering.
- Supervisor: Dr. Colleen Bailey & Dr. Tao Yang.

*Denton, Texas, U.S.A*

*Jan. 2018 - present*

### Huazhong University of Science and Technology.

VISITING RESEARCHER

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

*Wuhan, China*

*May 2018 - Jul. 2018*

### Zhejiang University.

VISITING RESEARCHER

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

*Hangzhou, China*

*Jul. 2018 - Jul. 2018*

### New York University.

RESEARCH ASSISTANT

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

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

*Jan. 2016 - Jul. 2016*

## Publications

### JOURNAL ARTICLES [ 7 ]

A Primal-Dual SGD Algorithm for Distributed Nonconvex Optimization

Xinlei Yi, Shengjun Zhang, Tao Yang, Tianyou Chai, Karl H Johansson

*SIAM Journal on Optimization* (Under Review).

Under Review

### 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* (Under Review). 

Under Review

### 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* (Under Review)

. Under Review

### Variance Aware Reward Smoothing for Deep Reinforcement Learning

Yunlong Dong, Shengjun Zhang, Xing Liu, Yu Zhang, Ye Yuan

*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

### Event-triggered Based Distributed Optimization Algorithms (in Chinese)

Tao Yang, Lei Xu, Xinlei Yi, Shengjun Zhang, Ruijuan Chen, Yuzhe Li

*ACTA AUTOMATICA SINICA* (2021)

. 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. 

2016

## CONFERENCE PROCEEDINGS [9]

### 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*

Under Review

### Zeroth-order Algorithms for Distributed Stochastic Nonconvex Optimization

Xinlei Yi, Shengjun Zhang, Tao Yang, Tianyou Chai, Karl H Johansson

*In 38th International Conference on Machine Learning (ICML)*

*Virtual*

In Submission

### 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*

In Submission

### 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*

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*

2020

### Obstacle Avoidance and Navigation Utilizing Proximal Policy Optimization

Daniel Zhang, Colleen P. Bailey

*SPIE Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications II* 

*California, United States*

2020

### Optimal Control Under Communication Constraints for Multi-agent Unmanned Vehicles

Daniel Zhang, Colleen P. Bailey


*SPIE Artificial Intelligence and Machine Learning in Defense Applications II* 

*Edinburgh, United Kingdom*

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*

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*

2019

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

2021

Distributed Proportional-Integral Optimization Algorithms with Event-triggered Communication  
Wen Du, Xinlei Yi, Shengjun Zhang, Jemin George, Tao Yang

2019

Distributed Economic Dispatch over Networks with Markovian Communication Losses  
Junfeng Wu, Shengjun Zhang, Tao Yang, Ling Shi, Hong Wang

2018

## Honors & Awards

2020	<b>Third Place Graduate Student Poster Competition</b> , IEEE North Tech SAS	<i>Denton, Texas, U.S.A</i>
2019	<b>IEEE Outstanding Graduate Student</b> , IEEE local event	<i>Denton, Texas, U.S.A</i>
2019	<b>College of Engineering Dean Tuition Scholarship</b> , UNT	<i>Denton, Texas, U.S.A</i>
2019	<b>Toulouse Graduate School Scholarship</b> , UNT	<i>Denton, Texas, U.S.A</i>
2018	<b>College of Engineering Dean Tuition Scholarship</b> , UNT	<i>Denton, Texas, U.S.A</i>
2018	<b>Toulouse Graduate School Scholarship</b> , UNT	<i>Denton, Texas, U.S.A</i>
2012	<b>2<sup>nd</sup> prize</b> , Physics Experiment Competition of colleges	<i>Beijing, China</i>

## Certifications

2016 **Machine Learning**, Instructor: Andrew Ng, license: NNBCAXYFA2HK.

*Stanford University  
on Coursera*

## Mentoring

**Kelvin Darden**

*UNT*

M.S. STUDENT

*2018*

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

## Teaching Experiences

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

<b>Member</b>	IEEE HKN, IEEE Student Member, IEEE Young Professionals
<b>Journal Reviewer</b>	IET Control Theory and Applications Neurocomputing Automatica International Journal of Robust and Nonlinear Control
<b>Conference Reviewer</b>	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)