

SHENGJUN(DANIEL) ZHANG

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Cyber-Physical Energy System Laboratory (NTDP B241) ◇ University of North Texas, Denton, TX 76207

EDUCATION

- Doctor of Philosophy in Electrical Engineering**
(Minor in Business Management) January 2018 - Current
Department of Electrical Engineering, College of Engineering
University of North Texas
Supervisor: Prof. Tao Yang
- Master of Science in Electrical Engineering** January 2015 - January 2017
Tandon School of Engineering
New York University
- Bachelor of Science in *Automation of Honors Program*** September 2010 - June 2014
College of Information and Electrical Engineering
China Agricultural University

VISITING SCHOLAR

- Visiting Scholar** June 2018 - July 2018
Key Laboratory of Image Processing and Intelligent Control of Education Ministry
School of Automation, Huazhong University of Science and Technology
Supervisor: Prof. Ye Yuan
- Visiting Scholar** July 2018
Group of Networked Sensing and Control
College of Control Science and Engineering, Zhejiang University
Supervisor: Prof. Junfeng Wu

SKILLS AND INTERESTS

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|------------------------|--|
| Interests | Optimization, Machine Learning, Deep Reinforcement Learning, Distributed Optimization. |
| Design Software | MATLAB, Python, TensorFlow, PyTorch, Java, C++, Embedded C, Linux,
Assembly Language, Robot Operating System(ROS), V-Rep. |

PROJECTS

- Analyzing Distributed Optimization Algorithms via IQC** October 2018 - January 2019
Research Project
- We investigate the convergence rate of distributed push-pull based optimization algorithms, which are applied for a directed graph network. We present a unified framework based on integral quadratic constraints (IQCs) from robust control theory and formulate convergence analysis problems into a semidefinite program (SDP). Our method derives numerical upper bounds on convergence rates of the algorithms that we analyzed and improves the existing bounds. We illustrate the versatility of our proposed framework using several different existing distributed optimization algorithms. The framework that we discuss is a powerful tool for choosing algorithm.
- Nonlinear System Identification via Sparse Bayesian Learning** October 2018 - December 2018
Major Project as a part of curriculum
- In this project, I mainly reimplemented the *Sparse Bayesian Learning Algorithm*, proposed in “*A Sparse Bayesian Approach to The Identification of Nonlinear State-space Systems*” and applied it to identify a pendulum model, also, I used a deep learning approach to verify the results.

Applying Q-Learning to a 4×4 Tic-Tac-Toe

March 2018 - April 2018

Major Project as a part of curriculum

- Reinforcement learning is essential for applications where there is no single correct way to solve a problem. In this project, I show that reinforcement learning is very effective at learning how to play the game Tic-Tac-Toe, despite the high-dimensional state. The agent is not given information about what the blocks or grids look like - it must learn these representations and directly use the reward and Q-values to develop an optimal strategy. The Q-agent uses basic Q-Learning algorithm, and shows that it is able to achieve super-human performance.

UGV Integrated Mobile Platform

January 2016 - May 2016

Control/Robotics Research Laboratory Project

- Modeled the UGV integrated mobile platform and simulated it via V-rep.
- Implemented SLAM and control algorithms on the integrated mobile platform to make the UGV run and avoid obstacles automatically.

Simulating Katana and a Wall Following Vehicle via V-rep

March 2015 - May 2015

Major Project as a part of curriculum

- Model Katana robot arms, which has 4 revolute joints in V-rep.
- Simulated using Katana robot arms picking up an object from a desk and put it down to a different spot smoothly.
- Simulated a simple vehicle with a distance sensor and a force sensor follows a wall automatically.

JOURNAL PUBLICATION

- Yahui Chen, Jianhan Lin, Qing Jiang, Qi Chen, **Shengjun Zhang**, Li Li, “A Magnetic Nanoparticle Based Nucleic Acid Isolation and Purification Instrument for DNA Extraction of *Escherichia Coli* O157: H7.”, **Journal of Nanoscience and Nanotechnology**. 2016

CONFERENCE PUBLICATION

- **Shengjun Zhang**, Xinlei Yi, Jemin George, and Tao Yang, “Computational Convergence Analysis of Distributed Optimization Algorithms for Directed Graphs”, the 15th IEEE International Conference on Control and Automation. **Accepted** February 2019
- Xinlei Yi, **Shengjun Zhang**, Tao Yang, Junfeng Wu, Karl H. Johansson, “Event-Triggered Control for Consensus of Multi-Agent Systems with Output Saturation and Directed Topologies”, the 38th Chinese Control Conference(CCC). **Accepted** July 2019
- Junfeng Wu, **Shengjun Zhang**, Tao Yang, Ling Shi, Hong Wang, “Distributed Economic Dispatch over Networks with Markovian Communication Losses”, the 37th Chinese Control Conference(CCC). July 2018

TEACHING EXPERIENCE

- **Teaching Assistant** for *Signals and Systems*. Spring 2019
- **Teaching Assistant** for *Signals and Systems*. Fall 2018
- **Teaching Assistant** for *Advanced Topics in Electrical Engineering*. Fall 2018

SERVICE

- Reviewer for **Neurocomputing** October 2018 - present
- Reviewer for **IET Control Theory and Applications** October 2018 - present
- Reviewer for **IEEE International Conference on Control and Automation** January 2019 - present

MENTORSHIP EXPERIENCE

- Kelvin Darden, (M.S. project, UNT)
Project: Load Shedding in Smart Grid

June 2018 - November 2018

INTERNSHIP/TRAININGS

Electrical Engineer Internship,

Tellon Trading, Inc. Maintaining network and optimizing cost estimates.

January 2017 - December 2017

Electrical Engineer Internship,

Tianjin OuYa Instrument Co., Ltd.

July 2014 - December 2014

AWARDS AND CERTIFICATIONS

- College of Engineering Dean Tuition Scholarship March 2018
- Toulouse Graduate School Scholarship March 2018
- Courera Course Certifications of **Machine Learning** (License: NNBCAXYFA2HK) July 2016
- The second prize in the Physics Experiment Competition of colleges in Beijing March 2012
- The third-class scholarship for excellent academic performance 2012
- The second-class scholarship for excellent academic performance 2011

REFERENCE

- Dr. Tao Yang, Assistant Professor, **940-891-6876**, **tao.yang@unt.edu**.