Liangjie (Jeffrey) Chen

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Research Interests

data-driven control theory; mathematical optimization; algebraic graph theory; scientific and high performance computing

Education

University of Toronto

Ph.D., Electrical and Computer Engineering — In progress
M.A.Sc., Electrical and Computer Engineering — 2022
B.A.Sc. (Graduated with Honours), Computer Engineering — 2020
Minors in Artificial Intelligence Engineering, Robotics and Mechatronics Engineering

Research Experience

Graduate Student Researcher — August 2020 – Present
Department of Electrical and Computer Engineering, University of Toronto
Advisor: Prof. J. W. Simpson-Porco

- Current research project: data-driven disturbance rejection and estimation for unknown linear time-invariant systems
- Past research project: development and analysis of a fixed-point algorithm for the AC power flow problem

Undegraduate Student Researcher — May 2019 – April 2020
Department of Electrical and Computer Engineering, University of Toronto
Advisor: Prof. J. E. Tate

- Acceleration of Newton-Raphson based power flow computations by training convolutional neural nets to generate viable bus voltage values as initial conditions

Undergraduate Research Assistant — May – August 2017
Department of Mechanical and Industrial Engineering, University of Toronto
Advisor: Dr. A. Melnikov

- Comparison of Single Frequency-Thermal Wave Radar imaging and Lock-in Thermography on signal-to-noise ratio across wide frequency range and measurement time

Papers

L. Chen and J. W. Simpson-Porco, "Data-driven output regulation using single-gain tuning regulators," in *2023 IEEE Conference on Decision and Control*, (Singapore), pp. 2903–2909, Dec. 2023

L. Chen and J. W. Simpson-Porco, "A fixed-point algorithm for the AC power flow problem," in *2023 American Control Conference*, (San Diego, CA, USA), pp. 4449–4456, May 2023

L. Chen and J. E. Tate, "Hot-Starting the Ac Power Flow with Convolutional Neural Networks," Apr. 2020. arXiv: 2004.09342 [eess.SY]

A. Melnikov, L. Chen, D. R. Venegas, K. Sivagurunathan, Q. Sun, A. Mandelis, and I. R. Rodriguez, "Single frequency thermal wave radar: A next-generation dynamic thermography for quantitative non-destructive imaging over wide modulation frequency ranges," *Review of Scientific Instruments*, vol. 89, Apr. 2018

Honours and Awards

Postgraduate Scholarship – Doctoral 2024 – 2026
Natural Sciences and Engineering Research Council of Canada ($120,000 Total)

Ontario Graduate Scholarship (Declined) 2024
Government of Ontario, ($15,000 Total)

Ontario Graduate Scholarship 2023
Government of Ontario, ($15,000 Total)

Hatch Graduate Scholarship for Sustainable Energy Research 2023
Hatch Ltd., Canada, ($10,000 Total)

QEII Graduate Scholarship in Science and Technology 2022
Government of Ontario, ($15,000 Total)

Hatch Graduate Scholarship for Sustainable Energy Research 2022
Hatch Ltd., Canada, ($10,000 Total)

H. W. Price Research Fellowship in Electrical Engineering 2021
Hydro One Ltd., Canada, ($4,300 Total)

Undergraduate Student Research Award 2019
Natural Sciences and Engineering Research Council of Canada, ($5,600 Total)

Dean's Honours List ($\times 3$) 2018 – 2020
Faculty of Applied Science and Engineering, University of Toronto

President's Entrance Scholarship 2016
Faculty of Applied Science and Engineering, University of Toronto, ($2,000 Total)
Faculty of Arts and Science, University of Toronto ($2,000 Total, Declined)

Technical Skills

Programming Languages: MATLAB, Julia, Python, C++, C, LaTeX, Bash
Softwares and APIs:

- Mathematical Optimization: JuMP, CVX, YALMIP
- Power System Analysis: PowerModels.jl, MATPOWER
- Machine Learning: Flux.jl, PyTorch
- Others: Simulink

Teaching Experience

Teaching Assistant
University of Toronto

- ECE1659 Robust and Optimal Control (Winter 2024)
- ECE557 Linear Control Theory (Fall 2021-24)
- ECE311/ECE356 Introduction to Control Systems (Fall/Winter 2022-24)
- ECE216 Signals and Systems (Winter 2022-23)
- MAT290 Advanced Engineering Mathematics (Fall 2023, Head TA Fall 2024)
- MAT188 Linear Algebra (Fall 2020-2022)

Professional Training

Scientific and High Performance Computing June 2019
Compute Ontario Summer School

Professional Affiliations	**Student Member**, *Institute for Electrical and Electronics Engineers (IEEE)*	
	Student Member, *Society for Industrial and Applied Mathematics (SIAM)*	
Volunteering and Other Experience	**Event Planner**, *IEEE Control System Society/American Control Conference*	2024
	Violinist, *UofT Campus Philharmonic Orchestra*	2021 – Present
	Assistant Concertmaster, *Skule Music Chamber Night*	2019
	Fabrication Team Member, *Blue Sky Solar Racing*	2016 – 2017

Last Updated: June 18, 2025