Jing Shuang (Lisa) Li

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Academic Positions

Assistant Professor of Electrical Engineering and Computer Science — Sep 2023 – Present
Michigan Neuroscience Institute Affiliate
University of Michigan, Ann Arbor MI

Education

Ph.D. in Control & Dynamical Systems — Sep 2018 – Jun 2023
Thesis: Distributed Control Theory for Cyberphysical and Biological Systems
California Institute of Technology, Pasadena CA

B.A.Sc. in Engineering Science, Electrical and Computer Engineering Major — Sep 2013 – Jun 2018
University of Toronto, Toronto ON

Publications and Preprints

* denotes equal contribution

[25] Y. Du, **J. S. Li**, "Sparse State-Space Realizations of Linear Controllers", *in submission* [preprint]

[24] J. Gill, **J. S. Li**, "Firing Rate Neural Network Implementations of Model Predictive Control", *in submission* [preprint]

[23] Q. He, **J. S. Li**, "Associative Memory System via Threshold Linear Networks", *in submission* [preprint]

[22] P. Wu, **J. S. Li**, "An Evolutionary Algorithm for Actuator-Sensor-Communication Co-Design in Distributed Control", *in submission* [preprint]

[21] J. Gill, **J. S. Li**, "Identifying Network Structure of Nonlinear Dynamical Systems: Contraction and Kuramoto Oscillators", *to appear at 2026 American Control Conference (ACC)* [preprint]

[20] J. Gill, **J. S. Li**, "Identifying Network Structure of Linear Dynamical Systems: Observability and Edge Misclassification", *to appear at 2026 American Control Conference (ACC)* [preprint]

[19] J. Ting, **J. S. Li**, "Path Integral Bottleneck: An Algorithm-Agnostic Framework of Computation and Control", *in submission* [preprint]

[18] J. Ting, **J. S. Li**, "Two-Layer Attention Optimization for Bimanual Coordination", *2025 American Control Conference (ACC)* , pp. 2748–2754, 2025

[17] **J. S. Li**, "Toward Neuronal Implementations of Delayed Optimal Control", *2025 American Control Conference (ACC)*, pp. 2715–2721, 2025

[16] Y. Du, **J. S. Li**, "Distributed Continuous-Time Control via System Level Synthesis", *to appear at 2026 American Control Conference (ACC)* [preprint]

[15] J. Zhao, M. Yang, **J. S. Li**, "Human Balancing on a Log: A Switched Multi-Layer Controller", *2025 American Control Conference (ACC)*, pp. 1926–1931, 2025

[14] L. Karashchuk*, **J. S. Li***, G. M. Chou, S. Walling-Bell, S. L. Brunton, J. C. Tuthill, B. W. Brunton, "Sensorimotor delays constrain robust locomotion in a 3D kinematic model of fly walking", *eLife* 13:RP99005, 2024

[13] A. Aspeel, J. Nylof, **J. S. Li**, N. Ozay, "A Low Rank Approach to Minimize Sensor-to-Actuator Communication in Finite Horizon Output Feedback", *IEEE Control Systems Letters (L-CSS)*, pp. 3609–3614, 2023

[12] **J. S. Li**, C. Amo Alonso, "Global Performance Guarantees for Localized Model Predictive Control", *IEEE Open Journal of Control Systems*, vol. 2, pp. 325–336, 2023

[11] **J. S. Li***, A. A. Sarma*, T. J. Sejnowski, J. C. Doyle, "Internal feedback in the cortical perception–action loop enables fast and accurate behavior", *Proceedings of the National Academy of Sciences (PNAS)*, vol. 120 (39), pp. e2300445120, 2023

[10] C. Amo Alonso, **J. S. Li**, N. Matni, J. Anderson, "Distributed and Localized Model Predictive Control—Part II: Theoretical Guarantees", *IEEE Transactions on Control of Network Systems (TCNS)*, vol. 10 (3), pp. 1113–1123, 2023. ***IEEE Transactions on Control of Network Systems Best Paper Award***

[9] F. Xiao, **J. S. Li**, J. C. Doyle, "Flux Exponent Control Enables Prediction of Metabolism Dynamics", *American Control Conference (ACC)*, pp. 1189–1194, 2023

[8] **J. S. Li**, J. C. Doyle, "Distributed Robust Control for Systems with Structured Uncertainties", *2022 IEEE Conference on Decision and Control (CDC)*, pp. 1702–1707, 2022

[7] L. Conger, **J. S. Li**, E. Mazumdar, S. L. Brunton, "Nonlinear System Level Synthesis for Polynomial Dynamical Systems", *2022 IEEE Conference on Decision and Control (CDC)*, pp. 3846–3852, 2022

[6] C. Amo Alonso, **J. S. Li**, J. Anderson, N. Matni, "Distributed and Localized Model Predictive Control—Part I: Synthesis and Implementation", *IEEE Transactions on Control of Network Systems (TCNS)*, vol. 10 (2), pp. 1058–1068, 2023

[5] **J. S. Li**, "Internal Feedback in Biological Control: Locality and System Level Synthesis", *American Control Conference (ACC)*, pp. 474–479, 2022. ***Best Student Paper Finalist***

[4] J. Stenberg, **J. S. Li**, A. A. Sarma, J. C. Doyle, "Internal Feedback in Biological Control: Diversity, Delays, and Standard Theory", *American Control Conference (ACC)*, pp. 462–467, 2022

[3] A. A. Sarma, **J. S. Li**, J. Stenberg, G. Card, E. S. Heckscher, N. Kasthuri, T. J. Sejnowski, J. C. Doyle, "Internal Feedback in Biological Control: Architectures and Examples", *American Control Conference (ACC)*, pp. 456–461, 2022

[2] **J. S. Li**, C. Amo Alonso, J. C. Doyle, "Frontiers in Scalable Distributed Control: SLS, MPC, and Beyond", *American Control Conference (ACC)*, pp. 2720–2725, 2021

[1] **J. S. Li**, D. Ho, "Separating Controller Design from Closed-Loop Design: A New Perspective on System-Level Controller Synthesis", *American Control Conference (ACC)*, pp. 3529–3534, 2020

Toolboxes

[T2] S. H. Tseng, **J. S. Li**, "SLSpy: Python-Based System-Level Controller Synthesis Framework", 2020 [pdf] [code]

[T1] **J. S. Li**, "SLS-MATLAB: MATLAB Toolbox for System Level Synthesis", 2019. [code]

Invited Talks

Layered control in animal sensorimotor systems — Jul 2025
Telluride Neuromorphic Cognition Engineering Workshop

Global Performance Guarantees for MPC Under Sparse Local Communication — Jun 2025
Leveraging Sparsity in Control Workshop
European Control Conference

What can control theory tell us about neural circuits? — Apr 2024
Dynamics of brain computations through the lens of control theory workshop
Computational and Systems Neuroscience (COSYNE) Conference

Layered control in animal sensorimotor systems — Dec 2024
Control Architecture Theory Workshop
IEEE Conference on Decision and Control

Optimal control in sensorimotor systems — Jun 2024
Autonomy Talks

Optimal control in animal sensorimotor systems — Apr 2024
10th Midwest Workshop on Control and Game Theory

Optimal feedback control in sensorimotor systems: behavior and implementation — Mar 2024
Manifolds in Nature Workshop

Optimal and distributed control in animals — Jan 2024
University of Michigan Controls Seminar

Control theory for neuroscience: from internal feedback to legged locomotion — Jul 2023
Woods Hole Workshop on Computational Neuroscience
Telluride Neuromorphic Cognition Engineering Workshop

Introduction to System Level Synthesis — Dec 2022
System Level Synthesis: New Frontiers in Distributed Control Workshop
IEEE Conference on Decision and Control

Internal Feedback Pathways: From Control Theory to Sensorimotor Systems (and beyond) — Nov 2021
Center for Computational Neuroscience, Flatiron Institute

Teaching

Control Systems Analysis and Design (EECS 460)	F2024, F2025
Linear Systems Theory (ECE 560/AERO 550/CEE 571/ME 564)	F2023, W2025
Special Topics: Control Theory for Biological Sensorimotor Systems (EECS 498/598)	W2024

Advising & Mentorship

PhD	**Master's**	**Undergraduate**
Yaozhi Du, W2025 –	Pengyang Wu, F2025	Bowen Mei, F2025 – W2026
Jaidev Gill, F2024 –	Enxu Liu, F2024	*PURE-ECE Program*
Eric (Qin) He, F2024 –	Riley Bridges, S/S2024 – F2024	Aida Ruan, S/S2024
Justin Ting, W2024 –	Ethan Parham, S/S2024 – F2024	*WISE RP Summer Scholar*
	Prerana Lakshmanan, S/S2024	Anisha Sharma, S/S2024
	Yaozhi Du, W2024 – F2024	Mo Yang, S/S2024 – F2024
	Qunzhuo Feng, F2023 – W2024	Jiayi Zhao, S/S2024 – F2024

W: Winter term (Jan – Apr); S/S: Spring/Summer term (May – Aug); F: Fall term (Sep – Dec)

Academic Service

Reviewer

American Control Conference (ACC)	IEEE Trans. on Automatic Control (TAC)
IEEE Conference on Decision and Control (CDC)	IEEE Trans. on Control of Networked Systems (TCNS)
IEEE Control Systems Letters (L-CSS)	IEEE Trans. on Vehicular Technology
IEEE Open Journal of Control Systems (OJCSYS)	Neural Computation

Organizing committee, 13th Midwest Workshop on Control and Game Theory (MWCGT)

Panel reviewer, Directorate for Engineering (ENG), NSF

Session chair/co-chair, ACC2025 Switched Systems, ACC2025 Biological and Bioinspired Systems

Poster/demo chair, 2024 ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)

Lead organizer, "System Level Synthesis: New Frontiers in Distributed Control" workshop at IEEE Conference on Decision and Control (2022)

Funding Awarded

NSERC PGSD (ranked 4/72 in electrical engineering)	Apr 2021
NSERC USRA (awarded twice)	May 2015, May 2016

Additional Experience

Piano and Voice Instructor, Lippert Music Center Sep 2012 – Jun 2018
Taught private music lessons and prepared students for Royal Conservatory exams and competitions

Undergraduate Thesis, Reconfigurable Antenna Lab (advisor: S. Hum) Sep 2017 – Apr 2018
Project: Neural network inverse models for electromagnetic metasurface design

Full-Time Software Engineering Intern, Verity Studios AG Sep 2016 – Aug 2017
Wrote code in Python, C++, and SQL to support drone flight planning, evaluation, and simulation

Student Researcher, Reconfigurable Antenna Lab (advisor: S. Hum) May 2016 – Aug 2016
Project: C++ simulation tool for periodic electromagnetic scatterers

Student Researcher, Lab for Advanced Power Conversion (advisor: P. Lehn) May 2015 – Aug 2015
Project: Wireless energy harvester for smart-grid monitoring applications

Student Researcher, Nanomaterials Lab (advisor: H. G. Wei) May 2014 – Aug 2014
Project: Copper-based nanostructures for photocatalytic hydrogen production

Additional Skills

Programming and scripting: MATLAB, Python, C++, SQL

Foreign languages: Mandarin Chinese (fluent), French (basic)

Instruments: piano, voice (classical, musical theatre, pop), cello, guitar
Certifications from the Royal Conservatory of Music:

- Associate (ARCT) in Piano Performance, 1st Class Honours (practical only)
- Grade 10 comprehensive certificate in Piano Performance, 1st Class Honours
- Grade 10 comprehensive certificate in Vocal Performance, 1st Class Honours