

Jing Shuang (Lisa) Li

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Academic Positions

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

* denotes equal contribution

- [19] J. Ting, **J. S. Li**, “Two-Layer Attention Optimization for Bimanual Coordination”, *in submission* [[pdf](#)]
- [18] **J. S. Li**, “Toward Neuronal Implementations of Delayed Optimal Control”, *in submission* [[pdf](#)]
- [17] Y. Du, **J. S. Li**, “State Feedback System Level Synthesis in Continuous Time”, *in submission* [[pdf](#)]
- [16] R. Bridges, E. Parham, **J. S. Li**, “Analyzing Fitts’ Law using Offline and Online Optimal Control with Motor Noise”, *in submission* [[pdf](#)]
- [15] J. Zhao, M. Yang, **J. S. Li**, “Human Balancing on a Log: A Switched Multi-Layer Controller”, *in submission* [[pdf](#)]
- [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*, vol. 10 (3), pp. 1113–1123, 2023

- [9] F. Xiao, **J. S. Li**, J. C. Doyle, “Flux Exponent Control Enables Prediction of Metabolism Dynamics”, *IEEE American Control Conference*, pp. 1189–1194, 2023
- [8] **J. S. Li**, J. C. Doyle, “Distributed Robust Control for Systems with Structured Uncertainties”, *IEEE Conference on Decision and Control*, pp. 1702–1707, 2022
- [7] L. Conger, **J. S. Li**, E. Mazumdar, S. L. Brunton, “Nonlinear System Level Synthesis for Polynomial Dynamical Systems”, *IEEE Conference on Decision and Control*, 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*, vol. 10 (2), pp. 1058–1068, 2023
- [5] **J. S. Li**, “Internal Feedback in Biological Control: Locality and System Level Synthesis”, *IEEE American Control Conference*, 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”, *IEEE American Control Conference*, 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”, *IEEE American Control Conference*, pp. 456–461, 2022
- [2] **J. S. Li**, C. Amo Alonso, J. C. Doyle, “Frontiers in Scalable Distributed Control: SLS, MPC, and Beyond”, *IEEE American Control Conference*, 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”, *IEEE American Control Conference*, 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

- “Optimal control in sensorimotor systems”. *Autonomy Talks*, Jun 2024
- “Optimal control in animal sensorimotor systems”. *10th Midwest Workshop on Control and Game Theory*, Apr 2024
- “Optimal feedback control in sensorimotor systems: behavior and implementation”. *Manifolds in Nature Workshop*, Mar 2024
- “Optimal and distributed control in animals”. University of Michigan, Jan 2024
- “Control theory for neuroscience: from internal feedback to legged locomotion”. *Woods Hole Workshop on Computational Neuroscience/Telluride Neuromorphic Engineering Workshop*, Jul 2023

“Introduction to System Level Synthesis”. *System Level Synthesis: New Frontiers in Distributed Control* workshop at *IEEE Conference on Decision and Control*, Dec 2022.

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

Posters

J. C. Doyle, C. Amo Alonso, **J. S. Li**, F. Xiao, “Rule-Based Systems Theory for Regulation in Networks of Biomolecules, Microbial Cells and Populations”, *8th Build-a-Cell Workshop*, 2022

J. S. Li, “Internal Feedback: From Optimal Control to the Sensorimotor System”, *Chen Institute for Neuroscience Poster Session*, 2021

J. S. Li, S. H. Tseng, “SLS-MATLAB Toolbox: Do-It-Yourself System Level Synthesis”, *IEEE American Control Conference*, 2020

J. S. Li, J. Yu, C. Amo Alonso, J. C. Doyle, “System Level Synthesis: Distributed Control Made Easy”, Poster at *Center for Autonomous Systems and Technologies (CAST) Scientific Showcase*, Caltech, 2020

Academic Service

Conference reviewer: IEEE American Control Conference (ACC), IEEE Conference on Decision and Control (CDC)

Journal reviewer: IEEE Control Systems Letters (L-CSS), IEEE Open Journal of Control Systems (OJCSYS), IEEE Transactions on Automatic Control (TAC), IEEE Transactions on Control of Networked Systems (TCNS), IEEE Transactions on Vehicular Technology, Neural Computation

Panel reviewer: Directorate for Engineering (ENG), NSF

Poster/Demo Chair, 2024 ACM/IEEE International Conference on Cyber-Physical Systems

Lead workshop organizer, “System Level Synthesis: New Frontiers in Distributed Control” 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

Teaching

Control Systems Analysis and Design (EECS 460) F2024

Special Topics: Control Theory for Biological Sensorimotor Systems (EECS 598 017) W2024

Linear Systems Theory (EECS 560) (co-taught with Brent Gillespie) F2023

Advising & Mentorship

PhD	Master’s	Undergraduate
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Yaozhi Du, W2025 –	Enxu Liu, F2024	Aida Ruan, S/S2024
Jaidev Gill, F2024 –	Riley Bridges, S/S2024 – F2024	<i>WISE RP Summer Scholar</i>
Eric (Qin) He, F2024 –	Ethan Parham, S/S2024 – F2024	Anisha Sharma, S/S2024
Justin Ting, W2024 –	Prerana Lakshmanan, S/S2024	Mo Yang, S/S2024 – F2024
	Yaozhi Du, W2024 –	Jiayi Zhao, S/S2024 – F2024
	Qunzhuo Feng, F2023 – W2024	

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

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