Junsoo Lee

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Contact Information

Department of Mechanical Engineering
University of South Carolina
300 Main Street Room A132
Columbia, SC 29208 US

Phone: +1 (803) 777-2502
E-mail: junsoo.lee@sc.edu
Website: www.junsoolee.com

Professional Positions

Assistant Professor 2022 – Present
Department of Mechanical Engineering, University of South Carolina

Graduate Research Assistant 2019 – 2022
School of Aerospace Engineering, Georgia Institute of Technology

Graduate Teaching Assistant 2018 – 2019
School of Aerospace Engineering, Georgia Institute of Technology

Graduate Research Assistant 2016 – 2018
Department of Aerospace Engineering, Seoul National University

Education

Ph.D. in Aerospace Engineering
Georgia Institute of Technology, 2022

M.S. in Mathematics
Georgia Institute of Technology, 2021

M.S. in Aerospace Engineering
Seoul National University, 2018

B.S. in Mechanical and Aerospace Engineering
Seoul National University, 2016

Publications and Talks

Archival Journal Publications:

J1. **J. Lee** and W. M. Haddad, "Fixed Time Stability and Stabilization of Discrete Autonomous Systems," *International Journal of Control*, to appear.

J2. **J. Lee**, W. M. Haddad, and M. Lanchares, "Finite Time Stability and Optimal Finite Time Stabilization for Discrete-Time Stochastic Dynamical Systems," *IEEE Transactions on Automatic Control*, to appear.

J3. W. M. Haddad and **J. Lee**, "Lyapunov Theorems for Stability and Semistability of Discrete-Time Stochastic Systems," *Automatica*, vol. 142, article no. 110393, 2022.

J4. W. M. Haddad and **J. Lee**, "Finite-Time Stabilization and Optimal Feedback Control for Nonlinear Discrete-Time Systems," *IEEE Transactions on Automatic Control*, to appear.

J5. W. M. Haddad, **J. Lee**, and S. P. Bhat, "Asymptotic and Finite Time Semistability for Nonlinear Discrete-Time Systems with Application to Network Consensus," *IEEE Transactions on Automatic Control*, to appear.

J6. **J. Lee** and W. M. Haddad, "On Finite-Time Stability and Stabilization of Nonlinear Hybrid Dynamical Systems," in *AIMS Mathematics*, vol. 6, no. 6, pp. 5535-5562, 2021.

J7. W. M. Haddad and **J. Lee**, "Finite-Time Stability of Discrete Autonomous Systems," *Automatica*, vol. 122, article no. 109282, pp. 1-8, 2020.

Conference Proceedings:

C1. **J. Lee** and W. M. Haddad, "Finite and Fixed Time Consensus Protocols for Discrete-Time Networks with Semistability Guarantees," in proceedings of *Mediterranean Conference on Control and Automation*, pp. 809-814, Athens, Greece, June 2022.

C2. **J. Lee** and W. M. Haddad, "Fixed Time Stability of Discrete Autonomous Systems," in proceedings of *Mediterranean Conference on Control and Automation*, pp. 526-531, Athens, Greece, June 2022.

C3. **J. Lee**, W. M. Haddad, and M. Lanchares, "Optimal Finite Time Control for Discrete-Time Stochastic Dynamical Systems," in proceedings of *American Control Conference*, pp. 3500-3505, Atlanta, GA, June 2022.

C4. **J. Lee**, W. M. Haddad, and S. P. Bhat "Stochastic Finite Time Stability of Discrete-Time Systems," in proceedings of *IEEE Conference on Decision and Control*, pp. 6646-6651, Austin, TX, December 2021.

C5. W. M. Haddad and **J. Lee**, "A Thermodynamic-Based Control Architecture for Semistability and Consensus of Discrete-Time Nonlinear Multiagent Systems," in proceedings of *IEEE Conference on Control Technology and Applications*, pp. 499-504, San Diego, CA, August 2021.

C6. W. M. Haddad and **J. Lee**, "Finite-Time Stabilization and Optimal Feedback Control for Nonlinear Discrete-Time Systems," in proceedings of *IEEE Conference on Control Technology and Applications*, pp. 202-207, San Diego, CA, August 2021.

C7. W. M. Haddad and **J. Lee**, "Lyapunov Theorems for Semistability of Discrete-Time Stochastic Systems with Application to Network Consensus with Random Communication Noise," in proceedings of *Mediterranean Conference on Control and Automation*, pp. 892-897, Bari, Italy, July 2021.

C8. W. M. Haddad and **J. Lee**, "Asymptotic and Finite Time Semistability for Nonlinear Discrete-Time Systems," in proceedings of *Mediterranean Conference on Control and Automation*, pp. 1281-1286, Bari, Italy, July 2021.

C9. W. M. Haddad and **J. Lee**, "Finite-Time Stability of Discrete Autonomous Systems," in proceedings of *American Control Conference*, pp. 5188-5193, Denver, CO, July 2020.

C10. **J. Lee**, N. Cho, and Y. Kim, "Smooth Trajectory Generation and Control of Multirotor with Slung Payload," Asian Pacific International Symposium on Aerospace Technology, Seoul, Republic of Korea, October 2017.

Textbooks and Monographs

B1. W. M. Haddad, Q. Hui, and **J. Lee**, *"Network Systems: A Dynamical Systems Approach,"* Philadelphia, PA: Society for Industrial and Applied Mathematics, submitted.

Book Chapters

BC1. W. M. Haddad and **J. Lee**, "Lyapunov Theorems for Semistability of Discrete- Time Stochastic Systems with Application to Network Consensus with Random Communication Noise," in *Smarter Cyber Physical Systems: Enabling Methodologies and Applications*, K. Vamvoudakis and F. L. Lewis, Eds., CRC Press, submitted.

Invited Talks

T1. **J. Lee**, "Dynamical Network Systems: Consensus Problem," *Smart Air Mobility Seminar*, Korea Aerospace University, Goyang, Korea, July 2022.

Professional Services

Professional Societies:
Member, Institute of Electrical and Electronics Engineers (IEEE)
Member, American Institute of Aeronautics and Astronautics (AIAA)
Member, The American Society of Mechanical Engineers (ASME)

Journals:
Reviewer, IEEE Transactions on Automatic Control
Reviewer, Automatica
Reviewer, IEEE Controls Systems Letters

Conferences:
Reviewer, 2022 IEEE American Control Conference (ACC)
Session Co-Chair, "Nonlinear Systems," 2021 IEEE Conference on Control Technology and Applications (CCTA)
Reviewer, 2021 IEEE Conference on Control Technology and Applications (CCTA)
Reviewer, 2021 IEEE Conference on Decision and Control (CDC)

Research Projects

Autonomy, Complexity, Neurocontrol, and Thermodynamics, in Large-Scale Network Aerospace Dynamical Systems Aug. 2019 - present
Source of Support: Air Force Office of Scientific Research

Korea Augmentation Satellite System Research Project 2016 - 2018
Source of Support: Agency for Defense Development

Awards & Honors

Student Travel Award, 2022
IEEE American Control Conference.

Student Travel Award, 2021
IEEE Conference on Decision and Control.

2021 Faces of Inclusive Excellence, 2021
Institute of Diversity, Equity, and Inclusion, Georgia Institute of Technology.

Student Travel Award, 2021
IEEE Conference on Control Technology and Applications.

Korean Government Scholarship for Overseas Study, 2018
National Institute for International Education, Ministry of Education.

Grand Prize (Minister Level), 2018
The 5^{th} Aviation-Specialized Universities Academic Conference, Kim-po, Republic of Korea, Jan, 2018.

Brain Korea 21 Plus Research Scholarship, 2016
Korean Ministry of Education.

Sin-yang Scholarship, 2014
Sin-yang Cultural Foundation.

Korean National Scholarship, 2013
Ministry of Education, Republic of Korea.

The Air Force Achievement Medal, 2012
Pacific Air Forces, United States Air Force.