SHIBA BISWAL

7370 Mathematical Sciences, University of California, Los Angeles, CA, 90095
sbiswal@math.ucla.edu, https://www.math.ucla.edu/~sbiswal

EDUCATION

Arizona State University, Tempe, Arizona
Ph.D. Mechanical Engineering   Spring 2020
Dissertation Title: "Self-Organization of Multi-Agent Systems Using Markov Chain Models"

Arizona State University, Tempe, Arizona
M.A. Mathematics   May 2019

Arizona State University, Tempe, Arizona
M.S. Mechanical Engineering   May 2015

Mumbai University, Mumbai, India
B.E. Mechanical Engineering   June 2009

PROFESSIONAL APPOINTMENTS

University of California, Los Angeles   July 2020 -
Hedrick Assistant Adjunct Professor, Department of Mathematics

Uhde India, ThyssenKrupp   Sep 2009 - May 2012
Mechanical Engineer

AWARDS

Outstanding Graduate Student Research   May 2020
Mechanical Engineering, Arizona State University

Outstanding Student Paper Award   Dec 2019
IEEE Conference on Decision and Control (CDC)

PUBLICATIONS

Journal Articles

1. Shiba Biswal, Hangjie Ji, Karthik Elamvazhuthi, Andrea Bertozzi. "Optimal Boundary Control of a Model Thin-Film Fiber Coating Model", To appear in *Physica-D Nonlinear Phenomena*, 2023

2. Shiba Biswal and Nicolas Lanchier. "The simple exclusion process on finite connected graphs", *Latin American Journal of Probability and Mathematical Statistics (ALEA)* Volume 20 (2023) 21-32.

3. Shiba Biswal, Karthik Elamvazhuthi and Spring Berman, "Decentralized Control of Multi-Agent Systems using Local Density Feedback," in *IEEE Transactions on Automatic Control (TAC)*, Volume 67, Issue 8, pp. 3920-3932, August 2022

4. Shiba Biswal, Karthik Elamvazhuthi, and Spring Berman. "Stabilization of Nonlinear Discrete-Time Systems to Target Measures Using Stochastic Feedback Laws." *IEEE Transactions on Automatic Control (TAC)*, Volume 66, Number 5, May 2021: 1957-1972

5. Karthik Elamvazhuthi, Shiba Biswal, and Spring Berman. "Controllability and Decentralized Stabilization of the Kolmogorov Forward Equation for Markov Chains." *Automatica*, Volume 124, 2021:109351.

6. Shiba Biswal, Marc Mignolet, Armando A. Rodriguez. "Modeling and Control of Flapping Wing Micro Aerial Vehicles." *Bioinspiration & Biomimetics*, Volume 14, Number 2, 2019.

7. Vaibhav Deshmukh, Karthik Elamvazhuthi, Shiba Biswal, Zahi Kakish, and Spring Berman. "Mean-Field Stabilization of Markov Chain Models for Robotic Swarms: Computational Approaches and Experimental Results." *IEEE Robotics and Automation Letters,* Volume 3, Issue 3, 2018: 1985-1992.

Peer-Reviewed Conference Articles

1. Shiba Biswal, Karthik Elamvazhuthi, and Spring Berman. "Stabilization of Multi-Agent Systems to Target Distributions using Local Interactions." *International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, Cambridge, UK, 2020.

2. Shiba Biswal, Karthik Elamvazhuthi, Hans Mittelmann, and Spring Berman. "Spectral Gap Optimization of Divergence Type Diffusion Operators." *European Control Conference (ECC)*, Saint Petersburg, Russia, 2020.

3. Shiba Biswal, Karthik Elamvazhuthi, and Spring Berman. "Fastest Mixing Markov Chain on a Compact Manifold." *IEEE Conference on Decision and Control (CDC)*, Nice, France, 2019.

4. Karthik Elamvazhuthi, Shiba Biswal, and Spring Berman. "Mean-Field Stabilization of Robotic Swarms to Probability Distributions with Disconnected Supports." *IEEE American Control Conference (ACC)*, Milwaukee, WI, 2018.

5. Karthik Elamvazhuthi, Matthias Kawski, Shiba Biswal, Vaibhav Deshmukh, and Spring Berman. "Mean-field Controllability and Decentralized Stabilization of Markov Chains." *IEEE Conference on Decision and Control (CDC)*, Melbourne, Australia, 2018.

INVITED TALKS

1. SIAM Conference on Optimization, Talk in Mini-Symposium on *Advances in Numerical Optimization, Control, and Applications*   June 2023

2. American Control Conference, Talk in Session on *Control of Distributions: Theory and Applications*   May 2021.

TEACHING EXPERIENCE

University of California, Los Angeles – Instructor

1. Mathematical Modeling (Fall 2022, Winter 2023, Spring 2023)

2. Ordinary Differential Equations (Fall 2020, Winter 2021, Spring 2021, Fall 2021, Spring 2022)

3. Linear and Nonlinear Differential Equations, (Winter 2022, Spring 2022)

Arizona State University – Teaching Assistant

1. Vibration Analysis (Fall 2014)

2. System Dynamics and Control (Fall 2013)

3. Computer Aided Engineering II (Spring 2013)