Bhathiya Rathnayake

San Diego, CA | brm222@ucsd.edu | +1 (518) 596 5193 | Publications | LinkedIn | My Website

EDUCATION

University of California San Diego — **Jul 2022 – Jun 2025**
PhD in Intelligent Systems, Robotics, & Control, GPA: 3.85/4.0 — *San Diego, CA*

Rensselaer Polytechnic Institute — **Jan 2020 – May 2022**
MS in Computer & Systems Engineering, GPA: 3.89/4.0 — *Troy, NY*

University of Peradeniya — **Jan 2014 – Oct 2017**
BSc in Electrical & Electronic Engineering, GPA: 3.65/4.0 — *Sri Lanka*

TECHNOLOGIES

Control Systems: PDE System Modeling, Non-linear Control, Adaptive Control, Model Predictive Control, Observers
Robotics: Reinforcement Learning, Optimization, State Estimation, SLAM, Motion Planning
Data Analysis: Probabilistic Modeling, Statistical Methods
Electrical Engineering: Analog Circuits, Power Electronics
Languages: Matlab/Simulink, Python, C++
Frameworks: TensorFlow, Keras, PyTorch, Scikit-learn

EXPERIENCE

University of California San Diego — **Jul 2022 – Present**
Graduate Student Researcher — Focus: PDEs, Event-triggered Control, Traffic/Water Systems — *San Diego, CA*

- Solved the global exponential stability problem for linear parabolic & hyperbolic PDEs under event-triggered control with dynamic triggering, addressing a problem that had **remained unsolved for 7 years**
- Developed the **first** periodic event-triggered and self-triggered control strategies for parabolic & hyperbolic PDEs with industrial applications in traffic control and water management in reservoirs
- Simulated traffic and water systems to validate the developed control algorithms
- Documented results in research articles published in IEEE Transactions on Automatic Control (IEEE TAC) & Automatica

Los Alamos National Laboratory — **Jul 2024 - Aug 2024**
Graduate Intern (remote) — Focus: Estimation and Control of Gas Flow in Pipeline Networks — *Remote Internship*

- Developed observers and controllers for gas pipeline networks subject to uncertainties
- Simulated gas flow in pipelines to validate the developed control algorithms
- Documented results in a research paper submitted to American Control Conference (ACC) 2025 [Available online: https://arxiv.org/abs/2409.17413]

Rensselaer Polytechnic Institute — **Apr 2020 - May 2022**
Graduate Research Student — Focus: PDEs, Event-triggered Control, 3D Printing — *Troy, NY*

- Developed event-triggered boundary control strategies for physics-based model of melting processes (Stefan problem) and reaction-diffusion processes with applications in 3D printing
- Documented results in research articles published in IEEE TAC, Automatica, & International Journal of Control

Sri Lanka Technological Campus — **Jan 2018 - Jul 2019**
Research Assistant — Focus: Hyperspectral Image Analysis — *Sri Lanka*

- Developed graph-based blind source separation algorithms for unmixing of hyperspectral images
- Documented results in a research article published in IEEE Transactions on Geoscience and Remote Sensing

University of Peradeniya — **Jan 2017 - Oct 2017**
Undergraduate Research Student — Focus: Robotics and Control — *Sri Lanka*

- Developed a **5-DOF underwater robotic vehicle (URV)** and performed system modeling and parameter identification
- Designed MIMO sliding mode controllers to address trajectory tracking and path following control of the URV
- Documented results in a research paper published in an IEEE conference

SELECTED PUBLICATIONS

(1) P. Zhang*, **B. Rathnayake***, M. Diagne, and M. Krstic, "Performance-Barrier Event-Triggered PDE Control of Traffic Flow", to appear in IEEE Transactions on Automatic Control, 2025 (****equal contributions***)

(2) **B. Rathnayake**, M. Diagne, J. Cortes, and M. Krstic, "Performance-barrier event-triggered control of a class of reaction-diffusion PDEs", Automatica 174, 112181, 2025

(3) **B. Rathnayake** and M. Diagne, "Observer-based periodic event-triggered and self-triggered boundary Control of a class of parabolic PDEs", IEEE Transactions on Automatic Control, vol. 69, no. 12, pp. 8836 - 8843, 2024

(4) **B. Rathnayake** and M. Diagne, "Observer-based event-triggered boundary control of the one-phase Stefan problem", International Journal of Control, vol. 97, no. 12, pp. 2975-2986, 2024

(5) **B. Rathnayake**, M. Diagne, and I. Karafyllis, "Sampled-data and event-triggered boundary control of a class of reaction-diffusion PDEs with collocated sensing and actuation", Automatica 137, 110026, 2022

(6) **B. Rathnayake**, M. Diagne, N. Espitia, and I. Karafyllis, "Observer-based event-triggered boundary control of a class of reaction-diffusion PDEs", IEEE Transactions on Automatic Control, vol. 67, no. 6, pp. 2905 – 2917, 2022

(7) E. M. M. B. Ekanayake, H. M. H. K. Weerasooriya, D. Y. L. Ranasinghe, S. Herath, **B. Rathnayake**, G. M. R. I. Godaliyadda, M. P. B. Ekanayake, and H. M. V. R. Herath, "Constrained nonnegative matrix factorization for blind hyperspectral unmixing incorporating endmember independence", IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, vol. 14, pp. 11853 - 11869, 2021

(8) **B. Rathnayake**, E. M. M. B. Ekanayake, K. Weerakoon, G. M. R. I. Godaliyadda, M. P. B. Ekanayake, and H. M. V. R. Herath, "Graph-based blind hyperspectral unmixing via nonnegative matrix factorization", IEEE Transactions on Geoscience and Remote Sensing, vol. 58, no. 9, pp. 6391-6409, 2020

REVIEW SERVICES

- IEEE Transactions on Automatic Control
- Automatica
- IEEE Transactions on Cybernetics
- Systems & Control Letters
- International Journal of Control
- Conference on Decision and Control (CDC)
- American Control Conference (ACC)
- European Control Conference (ECC)