

# Bhathiya Rathnayake

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## EDUCATION

<b>University of California San Diego</b> <i>PhD in Intelligent Systems, Robotics, &amp; Control, GPA: 3.85/4.0</i>	<b>Jul 2022 – Jun 2025</b> <i>San Diego, CA</i>
<b>Rennselaer Polytechnic Institute</b> <i>MS in Computer &amp; Systems Engineering, GPA: 3.89/4.0</i>	<b>Jan 2020 – May 2022</b> <i>Troy, NY</i>
<b>University of Peradeniya</b> <i>BSc in Electrical &amp; Electronic Engineering, GPA: 3.65/4.0</i>	<b>Jan 2014 – Oct 2017</b> <i>Sri Lanka</i>

## 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

<b>Los Alamos National Laboratory</b> <i>Graduate Intern — Focus: Estimation and Control of Gas Flow in Pipeline Networks</i> <ul style="list-style-type: none"><li>Developed observers and controllers for gas pipeline networks subject to uncertainties</li><li>Simulated gas flow in pipelines to validate the developed control algorithms</li><li>Documented results in a research paper submitted to American Control Conference (ACC) 2025</li></ul>	<b>Jun 2024 - Aug 2024</b> <i>Los Alamos, NM</i>
<b>University of California San Diego</b> <i>Graduate Student Researcher — Focus: PDEs, Event-triggered Control, Traffic/Water Systems</i> <ul style="list-style-type: none"><li>Solved the global exponential stability problem for linear parabolic &amp; hyperbolic PDEs under event-triggered control with dynamic triggering, addressing a problem that had remained unsolved for 7 years</li><li>Developed the first periodic event-triggered and self-triggered control strategies for parabolic &amp; hyperbolic PDEs with industrial applications in traffic control and water management in reservoirs</li><li>Simulated traffic and water systems to validate the developed control algorithms</li><li>Documented results in research articles published in IEEE Transactions on Automatic Control (IEEE TAC) &amp; Automatica</li></ul>	<b>Jul 2022 – Present</b> <i>San Diego, CA</i>
<b>Rensselaer Polytechnic Institute</b> <i>Graduate Research Student — Focus: PDEs, Event-triggered Control, 3D Printing</i> <ul style="list-style-type: none"><li>Developed event-triggered boundary control strategies for physics-based model of melting processes (Stefan problem) and reaction-diffusion processes with applications in 3D printing</li><li>Documented results in research articles published in IEEE TAC, Automatica, &amp; International Journal of Control</li></ul>	<b>Apr 2020 - May 2022</b> <i>Troy, NY</i>
<b>Sri Lanka Technological Campus</b> <i>Research Engineer — Focus: Hyperspectral Image Analysis</i> <ul style="list-style-type: none"><li>Developed graph-based blind source separation algorithms for unmixing of hyperspectral images</li><li>Documented results in a research article published in IEEE Transactions on Geoscience and Remote Sensing</li></ul>	<b>Jan 2018 - Jul 2019</b> <i>Sri Lanka</i>
<b>University of Peradeniya</b> <i>Undergraduate Research Student — Focus: Robotics and Control</i> <ul style="list-style-type: none"><li>Developed a 5-DOF underwater robotic vehicle (URV) and performed system modeling and parameter identification</li><li>Designed MIMO sliding mode controllers to address trajectory tracking and path following control of the URV</li><li>Documented results in a research paper published in an IEEE conference</li></ul>	<b>Jan 2017 - Oct 2017</b> <i>Sri Lanka</i>

## SELECTED PUBLICATIONS

- (J1) **B. Rathnayake**, M. Diagne, J. Cortes, and M. Krstic, “Performance-barrier event-triggered control of a class of reaction-diffusion PDEs [🔗](#)”, accepted for publication in Automatica
- (J2) **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
- (J3) **B. Rathnayake** and M. Diagne, “Observer-based event-triggered boundary control of the one-phase Stefan problem [🔗](#)”, International Journal of Control, 2024
- (J4) **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
- (J5) **B. Rathnayake**, M. Diagne, N. Espitia, and I. Karafyllis, “Observer-based event-triggered boundary control of a class

- of reaction-diffusion PDEs [\[2\]](#)”, IEEE Transactions on Automatic Control, vol. 67, no. 6, pp. 2905 – 2917, 2022
- (J6) **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 \[2\]](#)”, IEEE Transactions on Geoscience and Remote Sensing, 58(9), 6391-6409, 2020
- (C1) **B. Rathnayake**, A. Zlotnik, S. Tokareva, and M. Diagne, “[Setpoint tracking and disturbance attenuation for gas pipeline flow subject to uncertainties using backstepping \[2\]](#)”, submitted to IEEE ACC 2025
- (C2) P. Zhang, **B. Rathnayake**, M. Diagne, and M. Krstic, “[Performance-barrier-based event-triggered boundary control of congested ARZ traffic PDEs \[2\]](#)”, in IFAC-PapersOnLine, vol. 58, no. 10, pp. 182–187, 2024
- (C3) **B. Rathnayake**, M. Diagne, J. Cortes, and M. Krstic, “[Performance-barrier-based event-triggered boundary control of a class of reaction-diffusion PDEs \[2\]](#)”, in IEEE ACC 2024, pp. 5313–5319
- (C4) **B. Rathnayake** and M. Diagne, “[Self-triggered boundary control of a class of reaction-diffusion PDEs \[2\]](#)”, in IEEE CDC 2023, pp. 6887–6892
- (C5) **B. Rathnayake** and M. Diagne, “[Observer-based periodic event-triggered boundary control of the one-phase Stefan problem \[2\]](#)”, in IFAC-PapersOnLine, vol. 56, no. 2, pp. 11415–11422, 2023
- (C6) **B. Rathnayake** and M. Diagne, “[Periodic event-triggered boundary control of a class of reaction-diffusion PDEs \[2\]](#)”, in IEEE ACC 2023, pp. 1800–1806
- (C7) **B. Rathnayake** and M. Diagne, “[Event-based boundary control of the Stefan problem: A dynamic triggering approach \[2\]](#)”, in IEEE CDC 2022, pp. 415–420.
- (C8) **B. Rathnayake** and M. Diagne, “[Event-based boundary control of one-phase Stefan problem: A static triggering approach \[2\]](#)”, in IEEE ACC 2022, pp. 2403–2408
- (C9) **B. Rathnayake**, M. Diagne, and I. Karafyllis, “[Sampled-data boundary control of a class of reaction-diffusion PDEs with collocated sensing and actuation \[2\]](#)”, in IEEE CDC 2021, pp. 434–441
- (C10) **B. Rathnayake**, M. Diagne, N. Espitia, and I. Karafyllis, “[Event-triggered output-feedback boundary control of a class of reaction-diffusion PDEs \[2\]](#)”, in IEEE ACC 2021, pp. 4069–4074
- (C11) **B. Rathnayake**, K. M. K. Weerakoon, G. M. R. I. Godaliyadda, and M. P. B. Ekanayake, “[A robust control paradigm for path following of an underwater robotic vehicle \[2\]](#)”, in 2018 IEEE International Conference on Computer Science & Education (ICCSE), pp. 1-6

## Review Services

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