

## Ram Padmanabhan

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### EDUCATION

**University of Illinois Urbana-Champaign**  
Ph.D. Electrical and Computer Engineering  
Advisor: Prof. Melkior Ornik

Urbana, IL, USA  
August 2023 — Present

**University of Michigan**  
M.S. Electrical and Computer Engineering  
Advisor: Prof. Peter Seiler

Ann Arbor, MI, USA  
August 2021 — April 2023

**PES University**  
B. Tech Electronics and Communication Engineering  
Advisors: Prof. Rajini Makam and Prof. Koshy George  
Capstone Project: *Adaptive Iterative Learning Control*

Bengaluru, India  
August 2017 — June 2021

### PUBLICATIONS

#### Preprints:

- [1] **R. Padmanabhan** and M. Ornik, “[Approximate Energetic Resilience of Nonlinear Systems under Partial Loss of Control Authority](#),” *arXiv:2502.07603* [math.OC], Feb. 2025.
- [2] **R. Padmanabhan** and M. Ornik, “[Energetic Resilience of Linear Driftless Systems](#),” *arXiv:2410.00323* [math.OC], Oct. 2024.

#### Journal Articles:

- [3] **R. Padmanabhan** and P. Seiler, “[Analysis of Gradient Descent with Varying Step Sizes using Integral Quadratic Constraints](#),” *IEEE Transactions on Automatic Control*, 70(1), pp. 587–594, Jan. 2025.
- [4] **R. Padmanabhan**, R. Makam, and K. George, “[Multiple Estimation Models for Discrete-time Adaptive Iterative Learning Control](#),” *International Journal of Systems Science*, 55(10), pp. 2154–2171, 2024.
- [5] **R. Padmanabhan**, M. Shetty, and T. S. Chandar, “[Discrete Robust Control of Robot Manipulators using an Uncertainty and Disturbance Estimator](#),” *Journal of Dynamic Systems, Measurement and Control*, 145(5): 051022, May 2023.
- [6] **R. Padmanabhan**, M. Shetty, and T. S. Chandar, “[Discrete-Time Design and Applications of Uncertainty and Disturbance Estimator](#),” *International Journal of Robust and Nonlinear Control*, 31(10), pp. 4994–5015, Jul. 2021.

#### Conference Papers:

- [7] **R. Padmanabhan**, C. Bakker, S. A. Dinkar, and M. Ornik, “How Much Reserve Fuel: Quantifying the Maximal Energy Cost of System Disturbances,” in *63rd IEEE Conference on Decision and Control (CDC)*, Milan, Italy, Dec. 2024.
- [8] **R. Padmanabhan**, M. Bhushan, K. K. Hebbar, R. Makam, and K. George, “[Second-Level Adaptation and Optimization for Multiple Model Adaptive Iterative Learning Control](#),” in *Seventh Indian Control Conference (ICC)*, Mumbai, India, Dec. 2021, pp. 289–294.
- [9] S. Damodaran, **R. Padmanabhan**, R. Maahin, and S. Gurugopinath, “[A Copula-Driven Unsupervised Learning Framework for Anomaly Detection with Multivariate Heterogeneous Data](#),” in *IEEE 31st International Workshop on Machine Learning for Signal Processing*, Gold Coast, Queensland, Australia, Oct. 2021.

- [10] **R. Padmanabhan**, M. Bhushan, K. K. Hebbar, R. Makam, and K. George, “A Novel Strategy with Multiple Models to Improve Performance of Adaptive Iterative Learning Control,” in *IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT)*, Bengaluru, India, Jul. 2021.
- [11] **R. Padmanabhan**, S. Damodaran, V. N. Batra, and S. Gurugopinath, “A Convolutional Neural Network Architecture for Camera Model Identification with Small Datasets,” in *IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT)*, Bengaluru, India, Jul. 2020.

#### AWARDS AND FELLOWSHIPS

Joan and Lalit Bahl Fellowship	August 2024 — May 2025
Prof. CNR Rao Merit Scholarship	August 2017 — May 2020
Prof. MRD Merit Scholarship	August 2017 — May 2020

#### MENTORING

<b>Undergraduate Research Apprenticeship Program (URAP)</b>	August 2024 — May 2025
<b>Promoting Undergraduate Research in Engineering (PURE)</b>	August — December 2023
Mentored a group of three undergraduates at UIUC in investigating the performance of different nonlinear Kalman filters on the problem of battery state-of-charge estimation. (One student subsequently joined our primary research group.)	

#### TEACHING

<b>Graduate Student Instructor, University of Michigan</b>	Ann Arbor, MI, USA
<i>EECS 460 — Control System Analysis and Design</i>	January — April 2023
Held two discussion sessions each week, with teaching evaluations among the University’s highest.	
<b>Graduate Student Instructor, University of Michigan</b>	Ann Arbor, MI, USA
<i>EECS 301 — Probabilistic Methods in Engineering</i>	August — December 2022
Held two discussion sessions each week, with teaching evaluations among the University’s highest.	

#### EXPERIENCE

<b>Research Intern, Indian Institute of Technology, Bombay</b>	Mumbai, India
<i>Systems and Control Engineering</i>	December 2020 — May 2021
Used feedback linearization to achieve an upwind climb in gliding unmanned aerial vehicles with various wind gradient models, avoiding heavy computations from optimal control formulations.	
<b>Research Intern, Indian Space Research Organization</b>	Bengaluru, India
<i>Control and Digital Electronics Group</i>	June — July 2019
Studied the properties of the Linear and Ensemble Kalman Filter, applied to a one- and three-dimensional motion estimation problem.	

#### PEER REVIEWER

American Control Conference	2024 —
IEEE Conference on Decision and Control	2024 —
IEEE Transactions on Industrial Electronics	2024 —
Automatica	2023 —
IEEE Transactions on Systems, Man and Cybernetics	2023 —

#### OTHER PRESENTATIONS

<b>Northwestern University, Midwest Workshop on Control and Game Theory</b> <i>How Much Reserve Fuel: Quantifying the Maximal Energy Cost of System Disturbances</i>	Evanston, IL, USA <i>April 2024</i>
<b>University of California, Berkeley</b> <i>Analysis of Gradient Descent with Varying Step Sizes using IQCs [Online]</i>	Berkeley, CA, USA <i>February 2023</i>
<b>PES University</b> <i>Discrete-Time Design and Applications of Uncertainty and Disturbance Estimator</i>	Bengaluru, India <i>April 2021</i>

#### MEMBERSHIPS

**Graduate Student Member:** IEEE; IEEE Control Systems Society; IEEE Signal Processing Society