SREEHARI MANIKKAN

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EDUCATION

Purdue University   West Lafayette, IN
Ph.D., Mechanical Engineering   August 2021 – July 2026
Advisor: Dr. Ilias Bilionis

Indian Institute of Technology Madras   Chennai, Tamil Nadu, India
M.S., Mechanical Engineering   Jan 2019 - June 2021
Thesis: *Transfer Physics Informed Neural Networks: An improved framework for distributed physics-informed neural networks via parameter sharing*
Advisor: Dr. Balaji Srinivasan

NSS College of Engineering   Palakkad, Kerala, India
(Formerly affiliated to the University of Calicut)
B.Tech, Mechanical Engineering   Aug 2013 – July 2017

RESEARCH EXPERIENCE

Graduate Research Assistant   Purdue University, West Lafayette, IN
Advisor: Dr. Ilias Bilionis (Mechanical Engineering)   August 2021 – Present
- Project 1: Develop an AI based controller for autonomous buildings (NSF funded).
- Project 2: Develop an autonomous health management system for resilient extra-terrestrial habitat system (NASA funded).

Research scholar   IIT Madras, Chennai, Tamil Nadu, India
Advisor: Dr. Balaji Srinivasan (Mechanical Engineering)   Jan 2019 – June 2021
- Project: Develop a computationally efficient distributed physics informed neural network architecture for solving partial differential equations in forward and inverse problems.

Project Associate   IIT Madras, Chennai, Tamil Nadu, India
Advisor: Dr. Sateesh Gedupudi (Mechanical Engineering)   July 2018 – Dec 2018
- Project: Development of efficient falling film evaporators for vapor compression chiller packages (Voltas funded).

SCHOLASTIC ACHIEVEMENTS

Half Time Research Assistantship   Jan 2019
Secured assistantship from Ministry of Education, India for doing master's thesis research in IIT Madras.

Graduate Aptitude Test in Engineering May 2018
Secured 96.05 percentile in Mechanical Engineering test 2018 conducted by Govt of India with over 0.2 million aspirants.

Bachelor's degree with first class and honors Aug. 2017
Secured rank in top 5% in B.Tech Mechanical engineering from University of Calicut among 500+ students.

Prime minister scholarship Aug 2013
Received Govt of India prime minister scholarship for secondary school achievement and pursuing higher technical education by Kendriya Sainik Board, Govt of India.

PUBLICATIONS

1. Kuo TC, **Manikkan S**, Liu X, Devarapalli H, Bilionis I, Karava P. AI-enabled building energy model generation and domain randomization for control policy learning. Building and Environment. 2026 Jan;287:113815. https://doi.org/10.1016/j.buildenv.2025.113815

2. Murali Krishnan R, Zhang Z, Hao K, **Manikkan S**, Parsons P, Dyke S J, Bilionis I, Wang J, Xue C, Han S, Azimi M. HabSim-HMS: A systems testbed to investigate situational awareness for extraterrestrial habitation. AIAA Journal. 2025 Feb;63(2):389-403. https://doi.org/10.2514/1.J064693

3. Kuo T, **Manikkan S**, Bilionis I, Liu X, Karava P. Physics-informed machine learning framework to model buildings from incomplete information. In Journal of Physics: Conference Series 2023 Nov 1 (Vol. 2600, No. 7, p. 072013). IOP Publishing. https://doi.org/10.1088/1742-6596/2600/7/072013

4. **Manikkan S**, Srinivasan B. Transfer physics informed neural network: a new framework for distributed physics informed neural networks via parameter sharing. Engineering with Computers. 2023 Aug;39(4):2961-88. https://doi.org/10.1007/s00366-022-01703-9

UNPUBLISHED MANUSCRIPTS

1. **Manikkan S**, Karava P, Bilionis I. Thermal resistance-capacitance network with entropy switch for Bayesian network discovery. (*Prepared to submit in Applied Energy*)

2. **Manikkan S**, Rhee S, Bilionis I, Dyke S J. Physics-based Bayesian fault detection approach for an extraterrestrial habitat system subject to micrometeorite impact. (*Abstract accepted in IEEE AIAA Aerospace conference 2026. Journal manuscript under preparation.*)

3. **Manikkan S**, Reimer M, Chu Z, Chi M, Bilionis I, Dyke S J. Investigating large language model-based decision making for deep space habitat systems. (*Accepted in IEEE AIAA Aerospace conference 2026*)

4. Zhang Z, Parsons P, **Manikkan S**, Pillai M K R, Azimi M, Vaccino L, Dyke S J, Bilionis I, Wang J, Xue C. Managing delay-induced challenges in remote monitoring of uncrewed space habitats: the impact of forecasting telemetry visualizations. (*Submitted revised manuscript in Acta Astronautica*)

5. Mirfarah M, Park H, Chu Z, **Manikkan S**, Salmeron M, Montoya H, Rhee S, Silve C E, Bilionis I, Dyke S J. Experimental study on the impact of long delays on autonomous health management in deep space habitats. (*Submitted in Expert Systems with Applications*)

6. Chu Z, Hacker T. J, Mirfarah M, **Manikkan S**, Bilionis I, Dyke S J, Silve C E, Pillai M K R, Zhang Z, Chi M. Lessons learned from developing a health management system for the human centered autonomous resilient space habitat. (*Submitted in Advances in Engineering Software*)

7. Montoya H, Salmeron M, Mirfarah M, **Manikkan S**, Silve C E, Dyke S J. A cyber-physical testing framework for evaluating space habitat performance. (*Accepted in IEEE AIAA Aerospace conference 2026*)

PRESENTATIONS

1. "Thermal resistance-capacitance network with entropy switch for Bayesian network discovery". Poster presentation at Herrick Industrial Advisory Committee Day, Purdue University, WL, Oct 2025.

2. "Thermal resistance-capacitance network with entropy switch for Bayesian network discovery". Graphical abstract presentation at 19th annual Ecological Sciences and Engineering Symposium: Ripple Effect, Purdue University, WL, Sept 2025.

3. "Dynamical System with Entropy Switch for Bayesian Nonlinear Dynamics Discovery". Poster presentation at Graduate Research Symposium, Purdue University, Indianapolis, April 4, 2025.

4. "Health Management System of a Human centered Autonomous Resilient Space Habitat testbed". Oral presentation at NASA Annual review at RETHi, Purdue University, WL, June 4, 2024.

5. "CDCM: Control-oriented Dynamic Computational & Modeling Platform". Poster presentation at Herrick Industrial Advisory Committee Day, Purdue University, WL, Oct 2022.

6. "TPINN: An improved architecture for distributed physics informed neural networks". Recorded video presentation at Machine Learning for Engineering Modeling, Simulation, and Design workshop at NeurIPS 2020.

TEACHING EXPERIENCE

Graduate Teaching Assistant

Mechanical Engineering - Purdue University, WL, IN   Jan 2025 – May 2025
- ME 597 (Introduction to scientific machine learning)
- Held office hours and graded assignment solutions.

Undergraduate Teaching Assistant

Mechanical Engineering – IIT Madras, Chennai   Jan 2021 – May 2021
- Design and optimization of energy systems
- Prepared questionnaire, solution videos for quizzes, evaluated assignments and quiz responses.

MENTORING & SUPERVISION

Maurice Reimer (Part of Future Mentors Program, Purdue University)   June 2025 – Present
Aryan Goel (Purdue University)   June 2025 – Present
Vivek Oommen (IIT Madras)   Jan 2020 – May 2020

PROFESSIONAL DEVELOPMENT

Summer Mentoring Circle Program   Summer 2025
Engineering Academic Career Club – Purdue University
- Met biweekly with faculty mentors and peer mentees to discuss and prepare for an academic career.

Future Faculty Boot Camp   Fall 2025
The office of the Vice Provost for Graduate Students and Postdoctoral Scholars – Purdue University
- Attended a two-day boot camp featuring sessions on key components of the academic faculty application and hiring process.

ACADEMIC SERVICE

Purdue undergraduate research poster presentation judge   Fall 2024
Purdue undergraduate research presentation judge   Spring, Fall 2025
Organizing committee member, ICON Student Research Conference, Purdue   Fall 2025
Grant application reviewer, Purdue Graduate Student Government   Fall 2025