# DILEEP SIVARAMAN

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**Google Scholar:**
https://scholar.google.com/citations?user=R_I4Ut0AAAAJ&hl=en&oi=ao

## OBJECTIVE

I am looking for a research and teaching position in robotics and control systems, focusing on sensor fusion, control theory, and surgical robotics. I want to use my skills in adaptive filtering, nonlinear state estimation, and collaborative robotics to support research and development. I am also passionate about teaching, guiding students, and sharing knowledge to help them grow in this field. My goal is to contribute to both research and education in medical robotics and intelligent control systems.

## EDUCATION

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| **Defended Feb-17, 2025** | **Ph.D. Biomedical Engineering (Supervisor:** Songpol Ongwattanakul**) (Medical Robotics )** | **Mahidol University, Thailand** |
| **2012** | **Integrated M.Sc. (Physics & Mathematics)** | **Amrita Vishwa Vidyapeetham University**, Amritapuri Campus, Kollam, Kerala, **India** |
| **2007** | Higher Secondary Schooling | V.G.S.S.A HSS, Nediayavila, Kollam,Kerala ,India |
| **2005** | Secondary Schooling | K.R.K.P.M.BHS&VHSE, Kadampanad.Pathanamthitta,Kerala , India |

## SCHOLARSHIPS AND GRANTS (OR AWARDS AND SCHOLARSHIPS)

- Mahidol Postgraduate Scholarships for Graduate International Students [2020-2023].
- The Reinventing University System has funded the research, supported through Mahidol University (IO 864102063000), and Research Funding by Mahidol University under the project: Integrating Navigation and Robotics for breast biopsy using Imaging and Models (Pre-Clinic and Clinic Evaluation Phase for Product Commercialization)[2023-24]

## PUBLICATIONS

### International Journals

- Sivaraman, D., Pillai, B. M., Ongwattanakul, S., & Suthakorn, J. (2024). **Adaptive Polynomial Predictive Filter for Sensor Data Estimation and Prediction in Interference Environment. IET Control Theory and Applications.**

- Sivaraman, D., Ongwattanakul, S., Moonjaita, C., Suthakorn, J., & Madhavan Pillai, B. (2024). A pack hunting strategy for heterogeneous robots in rescue operations. **Bioinspiration & Biomimetics**.

- Sivaraman, Dileep, Songpol Ongwattanakul, Branesh M. Pillai, and Jackrit Suthakorn. "**Adaptive polynomial Kalman filter for nonlinear state estimation in modified AR time series with fixed coefficients." IET Control Theory & Applications (2024).**

- Pillai, Branesh M., Jackrit Suthakorn, Dileep Sivaraman, Sakol Nakdhamabhorn, Nantida Nillahoot, Songpol Ongwattanakul, Fumitoshi Matsuno, Mikhail Svinin, and Evgeni Magid. **"A heterogeneous robots collaboration for safety, security, and rescue robotics: e-ASIA joint research program for disaster risk and reduction management." Advanced Robotics** 38, no. 3 (2024): 129-151.

- Pillai, Branesh M., Peerapat Owatchaiyapong, Shen Treratanakulchai, Dileep Sivaraman, Songpol Ongwattanakul, and Jackrit Suthakorn. **"Lower Limb Exoskeleton With Energy-Storing Mechanism for Spinal Cord Injury Rehabilitation." IEEE Access** 11 (2023): 133850-133866.

- Sivaraman, Dileep, Songpol Ongwattanakul, Jackrit Suthakorn, and Branesh M. Pillai. **"Nonlinear Dynamic States' Estimation and Prediction Using Polynomial Predictive Modeling." IEEE Canadian Journal of Electrical and Computer Engineering** 46, no. 3 (2023): 185-195.

### International Journals (Submitted )

- **Adaptive Polynomial Kalman Filtering and Model Order Selection: Comparative Analysis with Polynomial and Autoregressive Representations**. (**IEEE Access, Under Review**)

- **Dynamic Order Selection Analysis in Adaptive Polynomial Kalman Filtering: Implementation and Integration of Sensor Data and Hybrid Image Processing for Bioinspired Needle System** (**Systems Science & Control Engineering, Under Review**)

- **Preliminary Analysis of a Bio-Inspired Dual-Sheath Needle Design for Robotic Biopsy Using Vision-Based Tracking** (**IET Journal of Engineering, Under Review**)

## International Proceedings

- Sivaraman, D., Wiratkapun, C., Pillai, B. M., Suthakorn, J., Methachan, B., Nakdhamabhorn, S., & Ongwattanakul, S. (2024). **Hybrid image-based motion tracking and adaptive polynomial Kalman filter for a bio-inspired dual-sheath needle system.** In *2024* ***IEEE International Conference on Robotics and Biomimetics (IEEE ROBIO)***. IEEE.

- Pillai, B. M., Siripala, N., Sai-aroon, K., Sivaraman, D., Vinjamuri, R., Chumnanvej, S., & Suthakorn, J. (2024). **Enhancing post-stroke upper limb rehabilitation through haptic feedback in virtual reality-based gaming**. In *2024* ***IEEE International Conference on Robotics and Biomimetics (IEEE ROBIO)***. IEEE.

- **Adaptive Polynomial Predictive Filter: Solving Inconsistent and Interrupted Sensor Data Challenges**." 2023 **IEEE International Conference on Robotics and Biomimetics** (ROBIO).

- **Energy Optimized Path Planning and Decision Making for Multiple Robots in Rescue Operations**, In ***IECON*** *2022–48th* ***Annual Conference of the IEEE Industrial Electronics Society*** (pp. 1-6). IEEE, Brussels, Belgium, 2022.

- **Sensorless Based Gravity Torque Estimation and Friction Compensation for Surgical Robotic System**, In *2022 IEEE 9th* ***International Conference on e-Learning in Industrial Electronics*** *(ICELIE)*, pp. 1-6. IEEE, Brussels, Belgium, 2022.

- **Energy Optimized Path Planning and Decision Making for Multiple Robots in Rough Terrain**, The Twenty-Seventh International Symposium on Artificial Life and Robotics 2022 (**AROB** 27th 2022), The Seventh International Symposium on BioComplexity 2022 (**ISBC** 7th 2022), The Fifth International Symposium on Swarm Behavior and Bio-Inspired Robotics 2022 (**SWARM** 5th 2022), ONLINE, January 25-27, 2022

## Peer-Reviewed Local Proceedings

- Teleoperative Pedicle Screw Insertion Guiding System for Spinal Fixation Operations, 18th Asian Conference on Computer Aided Surgery (**ACCAS**2022), and 5th International Conference on Business, Informatics, and Management (**ICBIM**2022)

- Curvature Estimation of Steerable Flexible Probe for Ductal Carcinoma in Situ Detection: A Simulation Study, 18th Asian Conference on Computer Aided Surgery (**ACCAS**2022) and 5th International Conference on Business, Informatics, and Management (**ICBIM**2022), Aug 2022.

## Book Chapter

- Sivaraman, D., Pillai, B. M., Suthakorn, J., & Ongwattanakul, S. (2024). Human–Robot Interaction in Biopsy Procedures: A Biomimetic Dual-Sheath Needle Design Inspired by Insect Ovipositor Mechanics. In Discovering the Frontiers of Human-Robot Interaction: Insights and Innovations in Collaboration, Communication, and Control (pp. 401-417). Springer Nature Switzerland.

## ACHIEVEMENTS

- Participated in RoboCup 2023 held in Bordeaux, France, from July 4th to 10th, 2023, as a member of the BART LAB ROBOTICS Team.

## PROJECTS

### FACULTY OF ENGINEERING, MAHIDOL UNIVERSITY

#### ❖ FULL TIME

- Bio-inspired needle-based Breast Biopsy Using a Novel State Estimation/Prediction Algorithm (2022-2024)
- e-ASIA Joint Research Program (e-ASIA JRP) Disaster Risk and Reduction Management (Torrential Rainfall, Associated Flood and Land Slide) (2022-2023)
- Development of Unmanned Aerial Vehicles for Disaster Risk and Reduction Management (2022-2023)
- Stairclimbing Wheelchair with Navigation and Mapping. (2022)

#### ❖ CONSULTANCY PROJECTS

- Mask Material Filtration Efficiency Test - Along with Faculty of Medicine, Siriraj Hospital, Mahidol University. (2020)

## MASTER'S THESIS

Title: **Photometric studies of galactic open star cluster Berkeley 7**

Supervisor**: Dr. Sneh Lata, Aryabhata Research Institute of Observational Sciences**
**(Department of Science and Technology, Government of India)**
**Manora Peak, Nainital, India**

## PROJECTS AT SCHOOL OF ARTS SCIENCE, AMRITA VISWA VIDYAPEEDAM UNIVERSITY.

Title: **Dynamics of Nonlinear Maps**

Supervisor: Dr. V. M Nandakumaran, Head of the Department of Physics

Amrita Vishwa Vidyapeetham University, Amritapuri Campus, Kerala, India

## DOCTORAL TEACHING ASSISTANTSHIP

- Computational Methods for Biomedical Engineering (Python, 2023-2024)
- Healthcare Automation - (Advanced Estimation Techniques in Healthcare Automation: From Kalman Filters to Machine Learning)

## EXPERIENCE

- Lecturer at Shree Vidyadhiraja College of Arts & Science, Karunagappally, Kerala University, Kerala, India (2017-2019)
- National Service Scheme - Programme Officer at Shree Vidyadhiraja College of Arts & Science, Karunagappally, Kerala University, Kerala, India (2017-2019)
- Lecturer at Al-Azhar Group of Institutions, Thodupuzha, Department of Technical Education (DTET) of Kerala, Kerala, India (2013-2017)

## WORKSHOP PARTICIPATED

- Workshop on '**Recent Trends in Physics**' 2011 was organized by the Indian Academy of Sciences, National Academy of Sciences, and Indian National Science Academy.

## AREA OF INTEREST

- Sensor Fusion, Control Theory, Bio-inspired Robotics, and Surgical Robotics

## COMPUTER SKILLS

- Programming: MATLAB, Python, and ROS
- Mechanical Designing: SolidWorks.
- OS: Windows and Linux**.**

## VOLUNTEER

- Technical Volunteer - RoboCup 2022, Bangkok
- Volunteer (Flood relief)- Plan International (India Chapter) 2018, Kerala, India