

Shanmuka Sadhu

732-926-6748 | ssadhu1@umd.edu | <https://www.linkedin.com/in/shan-sadhu> | <https://github.com/shanmukasadhu>
<https://medium.com/@shanmuka.sadhu>

EDUCATION

University of Maryland, College Park

Doctor of Philosophy in Computer Science

Advisor: Prof. Nirupam Roy

College Park, MD

Aug. 2026

RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY

Bachelor of Science in Computer Science, Bachelor of Science in Mathematics

Rutgers Honors College

GPA: 3.7

New Brunswick, NJ

Sep. 2023 – Jan, 2026

PAPERS & POSTERS

- Optimizing Restricted Boltzmann Machines for Human Activity Recognition using Quantum-Inspired Computing [\[Paper Link\]](#)
Shanmuka Sadhu*, Minsung Kim
- Improving Consistency Regularization using Consistency Regularization. [\[Paper Link\]](#)
Accepted at ICASSP 2026
Shanmuka Sadhu*, Weiran Wang
- Robust Ultrasound Tracking of a Millirobot using Neural Networks and Particle Filters. [\[Poster Link\]](#)
Presented at 2024 IUCRC Brain Symposium
Shanmuka Sadhu*, Yitong Lu, Julian Leclerc, Aaron T. Becker
- Task Decoding based on Eye Movements using Synthetic Data Augmentation [\[Paper Link\]](#)
Shanmuka Sadhu*, Arca Baran*, Preeti Pandey, Ayush Kumar

RESEARCH EXPERIENCE

Research Scholar

Dr. Nirupam Roy @ University of Maryland

Feb 2026 – May 2026

College Park, MD

- Constructing acoustic lenses with physics grounding and manufacturing constraints Paper under review at AAAI 2027

Independent Study Research Course

Dr. Minsung Kim @ Rutgers University

Sep 2025 – Dec 2025

New Brunswick, NJ

- Proposed an accelerated training method(**QiRBM**) for Restricted Boltzmann Machines using quantum-inspired computing techniques such as parallel tempering and the Metropolis-Hastings sampling scheme.
- Showed that our QiRBM outperformed classical RBM by at most **90%** in latency and **1%** in accuracy.

Machine Learning REU Research Fellow

Dr. Weiran Wang @ University of Iowa

May 2025 – September 2025

Iowa City, IO

- Improved upon current State-Of-The-Art audio-only architectures for Audio Event Recognition on AudioSet by using Consistency Regularization.
- Consistency Regularization with multiple data augmentation techniques resulting in a **4.9%** relative improvement compared to baseline models.
- Accepted at International Conference on Acoustics, Speech, and Signal Processing(ICASSP) 2026.

Robotics REU Research Fellow

Robotic Swarm Control Lab(Dr. Aaron Becker) @ University of Houston

May 2024 – October 2024

Houston, TX

- Developed and trained a Resnet-based CNN Algorithm to localize the millirobot from the ultrasound image feed.
- Implemented a Bayes Law-based particle filter to localize the millirobots within the ultrasound image feed.
- Combined the Resnet-based CNN Algorithm and Particle Filter to achieve an real-time error of **~3mm**, which was half the diameter of the millirobot.
- Another project involved implementing Reciprocal Velocity Obstacles (RVO) for swarm collision avoidance and comparing it to Artificial Potential Fields (APFs) and Control Barrier Functions (CBFs).

Robotics Researcher

June 2023 – April 2024

Algorithmic Robotic Control Lab(Dr. Jingjin Yu) @ Rutgers University

New Brunswick, NJ

- Performed different patterns with ten [microMVP](#) bots, such as squares, circles, figure eight, and triangles.
- Applied Multi-robot Path-Planning (MRPP) and Reciprocal Velocities Obstacles on the microMVP bots and successfully performed [five-bot robot collision-free path planning](#).
- All video demonstrations, including both real-time microMVP robot demos and simulation-based RVO experiments: <https://shanmukasadhu.github.io/shanmukarvo1/>
- Utilized Blender(CAD Software) to conceptualize microMVP v4 chassis. Evaluated potential motors, motor drivers, and microcontrollers, while integrating them into the chassis.

Machine Learning Research Assistant

May 2022 – October 2022

Vision Research and Technology Lab(Dr. Ayush Kumar) @ Harvard Medical School SERI

Virtual

- Implemented GAN-based(CTGAN, CopulaGAN, and Gretel.ai's CTGAN) models to generate high-quality synthetic spatio-temporal eye-tracking data, enhancing the dataset for cognitive intent prediction tasks.
- Used the Kolmogorov-Smirnov test to examine the quality of the synthetic data and achieved a score of 0.9.
- Implemented and evaluated Random Forest, LightGBM, and Gradient Boosting classifiers, achieving up to **82%** task-decoding accuracy compared to a **34%** baseline with synthetic data augmentations.
- Submitted work to NeurIPS GazeMeetsML Workshop 2023 and ACM ETRA 2023.