Arjun Viswanathan

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Education:

Northeastern University   Boston, MA
M.S. in Robotics | GPA: 3.85   *May 2026*
Relevant Courses: Robot Sensing and Navigation, Mobile Robotics, Robot Mechanics and Control, Reinforcement Learning (RL)

University of Massachusetts   Amherst, MA
B.S. in Computer Engineering | Info Tech (IT) Minor | GPA: 3.87   *May 2024*
Relevant Courses: Feedback Control, Intro to AI, Computer Networking, Continuous-Time Signal Processing, Circuits and Electronics, Discrete Math, Systems Programming, Intro to Cybersecurity, Image Processing

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Skills:

Software: ROS, ROS2, C, Linux, Python (TensorFlow, PyTorch), C++, MATLAB, Docker, NVIDIA Isaac Sim/Lab, PyBullet, Pinnochio, Structure From Motion (GTSAM), OpenCV, Slurm, AWS, SQL, Docker
Hardware: Arduino, Raspberry Pi/Pico, ESP32, LiDAR, RGBD cameras, BLDC motors, servos, IMU, encoders
Planning: SLAM, PRMs, RRTs, Kalman/Particle Filtering
Sensing and Perception: Object Detection, Depth Perception
Controls: Lyapunov Stability Analysis, Model Predictive Control, Feedback Control, Forward/Inverse Kinematics
Math: Manifolds, Lie Groups, SVD, Linear Algebra
AI: Deep/Machine/Reinforcement Learning, Multimodal Federated Learning, LLM, NLP, RAG

Robotics Experience:

Northeastern Silicon Synapse Lab - *Reinforcement Learning Team Lead*   *September 2024 - Present*
- Developing Deep Reinforcement Learning (DRL) policies for Husky-beta quadruped to navigate challenging terrains by land and air, using NVIDIA IsaacSim/Lab for simulation and training
- Bridging the sim-to-real gap by optimizing neural network-based locomotion policy for real-time execution on physical hardware
- Applying AI techniques such as reward shaping and curriculum learning to improve training efficiency and terrain adaptability
- Leading the expansion of the RL track on 3 more robots
    - Cobra snake robot loco-manipulation, Harpy biped multimodal gait, and Husky-Carbon quadruped multimodal gait

UMass Senior Design Project - *Sensing and Navigation Lead*   *September 2023 - May 2024*
- Developed smooth dynamic obstacle navigation for autonomous robot detecting 3 inch ArUco markers from 10 feet away using Nav2, OpenCV, and ROS2
    - Robot was able to execute paths in crowded environments while tracking moving markers without hitting obstacles
- Designed 3D geometric state estimation using an Extended Kalman Filter on encoder and IMU sensor fusion measurements
- Integrated speech-driven tracking commands and motion-predictive feedback control for fast tracking on limited system resources in an interdisciplinary team of computer and electrical engineers

UMass Mechatronics and Robotics Research Lab - *Research Assistant*   *September 2022 - May 2023*
- Programmed LiDAR Inertial Odometry (LIO) based navigation on a semi-autonomous medical assistant robot (Ubuntu Focal, ROS1 Noetic, and Python)
- Integrated teleoperation for precision grasping and manipulation of obstacles (opening drawers, interacting with objects)
- Collaborated with the Elaine Marieb College of Nursing to get feedback on robot performance and applications

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AI/ML Experience:

Travelers - *Data Engineering Intern*   *June 2023 - August 2023, June 2024 - August 2024*
- Designed and deployed AWS ML model CI/CD pipeline to reduce claim response delay from 1 week to 1 day
- Cleaned up and integrated new datasets into Target Customer Model, which predicts business gain from clients
- Contributed to GIS pre-emptive disaster detection using Nearmap imagery segmentation
- Tested LLM model with RAG to make the claims handling process more efficient

UConn Qian Yang Lab - *Machine Learning Research Intern*   *May 2022 - August 2022*
- Created Siamese Neural Network regression model using PyTorch to predict melting points for chemical compounds (Funded by NASA)
- Model predicted correct melting points and proportions of compounds with MAE of 0.25

Oak Ridge National Lab - *Machine Learning Remote Intern*   *June 2021 - August 2021*
- Developed DL models (CAE, GAN, CVAE) for pathogen strain and high entropy alloy classification using TensorFlow
- Achieved 74.95% accuracy for pathogen dataset and 99.7% accuracy for high entropy alloys using Convolutional Autoencoders
- Implemented distributed deep learning on the Summit supercomputer with Horovod, reducing execution time by 71.5% for pathogens and 8.5% for alloys

UMass Engineering Makerspace (M5) - *Computer Engineering Intern*   *September 2022 - May 2024*
- Taught ML classification, Computer Vision, and KiCAD workshops for student learning

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Awards:
- UMass IEEE Honor Society
- UMass IEEE Tesla Awards: Most Outstanding Computer Engineering Sophomore
- UMass Recipient of the PTC First Robotics Competition and Chancellor's Award Scholarships
- UMass Dean's List Honors