

## SREEKAR PRANEETH MARRI

[pransm19@bu.edu](mailto:pransm19@bu.edu) || +1 (818) 415-0476 || [LinkedIn](#) || [Google Scholar](#) || Boston, MA, USA

### EDUCATION

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<b>Boston University</b> <i>MS (Thesis) in Robotics &amp; Autonomous Systems with Specialization in Data Analytics; GPA: 3.88/4.0</i> <i>Thesis: "Real-Time Control of Multi-DOF Soft Robotic Actuators using Machine Learning and Model Predictive Control"</i>	Boston, Massachusetts Aug 2024 - May 2026
<b>University of California, Riverside</b> <i>Advanced Certificate in Engineering (Computer Science, Academic Transfer); GPA: 3.96/4.0</i>	Riverside, California Sep 2023 - Jun 2024
<b>Amrita School of Engineering, Bangalore</b> <i>BTech in Computer Science Engineering (Artificial Intelligence) with Distinction; GPA: 9.15/10.0</i>	Bengaluru, India Sep 2020 - Aug 2023

### PROFESSIONAL EXPERIENCE

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<b>Morphable Biorobotics Lab, Boston University</b> <i>Graduate Researcher for Prof. Tommaso Ranzani</i>	Boston, Massachusetts Sep 2024 - May 2026
<ul style="list-style-type: none"><li>Developing inverse models and reinforcement learning frameworks for precise open-loop and closed-loop control of multi-DoF soft actuators in underwater environments.</li><li>Designing a real-time control architecture for multi-chamber Stacked Balloon Actuators (SBAs) with integrated sensing and combining reinforcement learning for adaptive motion control.</li><li>Advancing data-driven modelling and trajectory-tracking methods to improve performance of soft robotic systems.</li></ul>	
<b>Tay Lab, Boston University School of Medicine</b> <i>Research Programmer for Prof. Tuan Leng Tay</i>	Boston, Massachusetts Nov 2024 - Mar 2025
<ul style="list-style-type: none"><li>Applied deep learning to high-resolution microscopy data to automate analysis of microglial cellular structures.</li><li>Designed and implemented end-to-end U-Net segmentation pipeline for robust microglial cell detection and feature extraction, enabling scalable, high-throughput image processing.</li><li>Managed the full MLOps workflow - from large-scale annotation to preprocessing to experimental tracking and deploying on HPC infrastructure, ensuring reproducibility and production-grade model training and evaluation.</li></ul>	
<b>Indian Institute of Science (IISc), Bangalore</b> <i>AI Research Intern under Prof. Punit Rathore</i>	Bengaluru, India Jun 2023 - Sep 2023
<ul style="list-style-type: none"><li>Fine-tuned a LLaMA2-based legal document assistant by developing advanced natural language processing (NLP) pipelines and creating robust web-scraping workflows to collect and curate high-quality, domain-specific legal datasets.</li><li>Evaluated and benchmarked large language model (LLM) outputs for accuracy, contextual relevance, and coverage of domain-specific legal knowledge to ensure reliable, high-performing results.</li><li>Conducted a comprehensive systematic literature review on road condition classification using smartphone sensor data, employing signal processing to extract relevant features and enhance classification accuracy.</li></ul>	
<b>New Space Research Technologies</b> <i>Robotic Intern</i>	Bengaluru, India Jul 2022 - Sep 2022
<ul style="list-style-type: none"><li>Simulated and validated quadcopter operations on real UAV hardware using the Robot Operating System (ROS) and Software-in-the-Loop (SITL) environments.</li><li>Implemented and optimized flight planning and control algorithms to improve mission stability and precise path tracking.</li><li>Integrated ROS-based Python modules for autonomous drone control, ensuring reliable communication between SITL simulations and physical quadcopter systems.</li></ul>	

### PUBLICATIONS

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- H.S. Chilakala, N. Preeti, **Sreekar Praneeth Marri**, K. Murali, "Kalman Integration with ARIMA & LSTM," *Advances in Networks, Intelligence and Computing*, 1st Edition, CRC Press, 2024, 8 pages, eBook ISBN 9781003430421, DOI: 10.1201/9781003430421-57.
  - H.S. Chilakala, N. Preeti, **S.P. Marri**, S. Palaniswamy, P.B. Pati, "Real-Time Object Detection Using Mobile Robot Captured Images: A Deep Learning Approach," *2024 3rd International Conference for Innovation in Technology (INOCON)*, Bangalore, India, 2024, pp. 1-6, DOI: 10.1109/INOCON60754.2024.10511303.
  - S.P. Marri**, B.V. Nikith, N.K.S. Keerthan, S. Jayan, "SVM Versus KNN: Prediction of Best Image Classifier," *In: Reddy V.S., Prasad V.K., Wang J., Rao Dasari N.M. (eds) Intelligent Systems and Sustainable Computing. ICISSC 2022. Smart Innovation, Systems and Technologies*, vol. 363, Springer, Singapore, 2023, DOI: 10.1007/978-981-99-4717-1\_14.
  - B.V. Nikith, N.K.S. Keerthan, **M.S. Praneeth**, Dr. T. Amrita, "Leaf Disease Detection and Classification," *Procedia Computer Science*, vol. 218, pp. 291-300, 2023, ISSN 1877-0509, DOI: 10.1016/j.procs.2023.01.011.

- N.K.S. Keerthan, **S.P. Marri**, M. Khanna, “Analysis of Key Based Cryptographic Algorithms and Its Applications,” *2023 IEEE 3rd International Conference on Technology, Engineering, Management for Societal Impact using Marketing, Entrepreneurship and Talent (TEMSMET)*, Mysuru, India, 2023, pp. 1-4, DOI: 10.1109/TEMSMET56707.2023.10150061.

## PROJECT EXPERIENCE

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### Edge-Optimized LLM for Autonomous Robotics (Llama3, Whisper, ROS)

- Integrated quantized Llama3 and Whisper models onto a mobile robotic platform to enable speech-driven, offline navigation with ROS, eliminating cloud dependencies for real-time performance.
- Demonstrated 96% positional and 93% rotational command accuracy at just 400ms inference latency, setting a benchmark for embedded language models in robotics.

### Reinforcement Learning-Based Robotic Arm for Color Sorting (ROS, Python)

- Led a team of three to develop a 5-DOF robotic arm for autonomous color-based object sorting using reinforcement learning with adaptive reward strategies.
- Linked simulation and hardware deployments to iteratively refine control policies, reducing misclassification and improving sorting consistency.

### LIGO Time-Series Anomaly Detection with Matrix Profiles (Python, Signal Processing)

- Applied matrix profiling techniques to LIGO H1/L1 gravitational wave datasets, detecting anomalies linked to astrophysical events.
- Built statistical workflows to improve event detection and cosmic classification accuracy.

### Real-Time Flight Delay Prediction System (Spark, Kafka, MongoDB, Hadoop)

- Designed a scalable big-data pipeline for live flight delay prediction using Spark Structured Streaming and Kafka.
- Improved prediction accuracy by 20% over baselines, enabling better scheduling and resource allocation.

### Dementia Detection via Fusion of Speech and Text Features (BERT, Audio Processing, Transformers)

- Combined log-mel spectrogram speech features with BERT-based text embeddings through vision-transformer architectures.
- Enhanced predictive accuracy by jointly analyzing acoustic and linguistic signals, advancing clinical diagnostics.

## SKILLS

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**Robotics & AI:** ROS, MATLAB, Simulink, SITL, PyTorch, TensorFlow, Transformers, OpenAI Gym, LLaMA, BERT Models  
**Programming & ML :** Python, SQL, Statistical Modelling, Data Pipelines, Regression, Matrix Profiles, KPI Analysis  
**Prototyping & Systems:** 3D Printing, Soft Actuator Fabrication, AutoCAD, Fusion 360, Adobe Illustrator  
**Big Data Tools:** Spark, Kafka, Hadoop, MongoDB

## AWARDS & ACHIEVEMENTS

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**Dean’s Scholarship Recipient**, Boston University College of Engineering 2024 - 2026  
**Ranked 7<sup>th</sup> in Programme**, Amrita School of Engineering, Bengaluru 2024  
**Placed in the Top 25 of the Honeywell Smart City Hackathon**, Bengaluru 2021

## TEACHING EXPERIENCE

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**Graduate Teaching Assistant**, ME 568 - *Soft Robotic Technologies*, Boston University Fall 2025  
**Graduate Course Grader**, CS 542 - *Principles of Machine Learning*, Boston University Fall 2025  
**Graduate Course Grader**, CS 541 - *Applied Machine Learning*, Boston University Spring 2025

## POSITION OF RESPONSIBILITY

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**Student Ambassador**, *Robotics and Autonomous Systems*, Boston University Jan 2025 - May 2026  
**Joint Secretary**, *FACE (CS) club*, Amrita School of Engineering Sep 2021 - Aug 2022  
**Class Representative**, *CSE (AI)*, Amrita School of Engineering Sep 2020 - Aug 2023

## COMMUNITY SERVICE

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### Live-In-Labs Program

*Rural Development and Sustainable Initiative* Jan 2023

- Conducted field surveys and data analysis in a rural village to identify socio-economic and infrastructural challenges.
- Designed and implemented sustainable, low-cost solutions to improve community living standards.

## CERTIFICATION

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### Indian Institute of Technology (IIT), Madras

*Online B.Sc. in Programming and Data Science, Completed Foundational Level* Jan 2023