Sreeharsha Paruchuri

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EDUCATION

Carnegie Mellon University, School of Computer Science — **Pittsburgh, PA**
Master of Science in Robotic Systems Development — **May 2026**
Current Relevant Courses: Advanced Computer Vision, Systems Engineering, Estimation and Control
Current Positions Held: Editor for the MRSD newsletter

International Institute of Information Technology (IIIT-H) — **Hyderabad, India**
Bachelor of Technology (Honours) in Electronics and Communication Engineering — **July 2022**
Junior/Final year CGPA: 9.02/10; Deans Merit List; Undergraduate Research Award
Relevant Coursework: Mobile Robotics, Robot Planning and Navigation, Robot Dynamics and Control, Statistical Methods in Artificial Intelligence, Topics in Applied Optimization, Computer Vision, Data Structures and Algorithms, Game Theory

SKILLS

Programming Languages: Python, C/C++, MATLAB, Racket, Swift, JavaScript, GoLang, Dart, Bash
Application Software: PyTorch, TensorFlow, OpenCV, Scikit-Learn, ROS, Docker, Flask, Django, MongoDB, SolidWorks

EXPERIENCE

Tata Consultancy Services | Pre-Doctoral Research Fellow — **July 2022 – July 2024**
- Led the project to enhance the navigation capabilities of audio-visual Embodied Artificial Intelligence agents with a novel, sound-agnostic reward to train a online reinforcement learning policy that decreased path length by 21%
- Developed the exploration and navigation algorithms that led to an improvement of 60% in metrics over the baseline which led to our **globally ranked fourth place finish** to the Habitat Open Vocabulary Mobile Manipulation Challenge at NeuralIPS '23

Robotics Research Center, IIIT-H | Research Assistant — **Dec 2019 – June 2022**
- Spearheaded development of the computer vision and navigation stack to simulate, build, test and deploy an autonomous washroom sanitisation robot; represented my university and **finished runners up** out of over 140 teams nationally
- Contributed to a novel attention-based deep neural network to jointly learn pose, depth, and hallucinate free space in a self-supervised manner in indoor environments with stereo vision inputs
- Held tutorials for fundamental concepts in Robotics and Computer Vision in addition to creating and evaluating assignments as a Teaching Assistant for the Mobile Robotics course for a class of over 65 graduate and undergraduate students

Cognitive Science Research Center, IIIT-H |Research Assistant — **Dec 2020 – May 2022**
- Applied statistical machine learning in tandem with concepts in Music Information Retrieval to analyse lyrical regularities in individuals' music listening history as an early indicator of mental illness; Published our results at INTERSPEECH 2021
- Scraped data from X (formerly Twitter), Reddit and Wikipedia to link music sharing trends on social media platforms with the mental health of individuals during COVID-19 and movements such as #blm; Published our results in a medical journal
- Organized guest lectures, managed course administration, created assignments and advised on projects as the Head Teaching Assistant for the Music, Mind and Technology course for a class of over 100 graduate and undergraduate students

Bosch Research and Technology Center | Computer Vision Intern — **May 2021 – Aug 2021**
- Fused information from Laser, Camera and Odometry data in conjunction with professional researchers from Daimler in Germany to boost online and offline Multi-Object Tracking algorithms in the Autonomous Driving context

The Center for Visual Information Technology, IIIT-H | Research Assistant — **Aug 2021 - Dec 2021**
- Worked on Temporal Action Recognition of skeletons on RGBD input and Proposed a novel Factorized Part Group approach that achieved SOTA performance on NTU-X while using 25% - 33% fewer parameters than competing models

PROJECTS

Augmented Reality and Robot Assisted Orthopaedic Knee Arthroplasty — **CMU | Sept 2024 - Present**
- Gathered and analyzed requirements from user studies, market competition, and sponsors to inform system development
- Conducted experiments to inform our trade studies on the robot manipulator and AR headset subsystems

Neural-Assisted Depth Disparity Estimation — **Hackathon |Nov 2022- Jan 2023**
- Finished in the **top 25 teams internationally** in developing an algorithm respecting onboard compute constraints to improve the real-world depth estimation accuracy of the OAK-D Pro
- Designed and thoroughly validated a pipeline using the DepthAI API to handle raw data streams from the camera and adhering to rigid frames per second constraints

3D Interactive Flying Game — **IIIT-H | Aug 2020 - Dec 2020**
- Built a 3D flight simulator game in OpenGL 3.0 using concepts such as texture mappings, rasterization and lighting, with support for multiple camera views.

Metaphor Generation — **Nvidia Singapore | May 2021 - Jul 2022**
- Aided in a project to generate metaphor datasets to increase Large-Language-Models' robustness in dealing with semantically grounded data. I contributed to the analysis of metaphors and their efficacy in communication during the period of COVID-19.

Image Classifier — **IIIT-H | Aug 2021 - Dec 2021**
- Trained various learning models on the American Sign Language image dataset with data augmentation such as various feature transformations and quantitatively analysed the results against an AlexNet model trained by transfer learning.

Research Paper Implementations — **IIIT-H | Aug 2020 – May 2021**
- Implemented methods such as: GrabCut, Bag of Visual Words, Lucas Kanade Tracking and Semantic Inpainting