

SHYAMSUNDAR PRABHAKAR INDRA

📍 College Park, MD, USA | 📞 +1 (240) 398 0284 | ✉ Email: shyampi@umd.edu | [in](#) LinkedIn: [Shyamsundar P I](#) | 📁 Portfolio: [Shyam-pi](#)

Domain Skills: Computer Vision (CV) • Machine Learning (ML) • Deep Learning (DL) • Robotic Software • Motion Planning • Virtual Reality

EDUCATION

UNIVERSITY OF MARYLAND

M.ENG. IN ROBOTICS

Aug 2022-Jun 2024 | College Park, MD

GPA: 4.00 / 4.00

Roles: TA - [ENME272](#) Spring 2023

COURSEWORK (* Ongoing) :

Foundations of Advanced Deep Learning*

Cognitive Robotics*

3D Vision

Robot Programming using C++

Human Robot Interaction

Advances in Extended Reality (XR)

Perception in Robots

Path Planning in Robots

Adv. Geometric Computer Vision

Intro. to Robot Modelling

BITS PILANI

B.E. IN MECHANICAL ENGINEERING

Aug 2016-Jul 2020 | Rajasthan, India

GPA: 8.20 / 10.00

KEY COURSEWORK:

Machine Learning

Object Oriented Programming with JAVA

Intro. to Robotics

Intro. to Programming using C

ACHIEVEMENTS

• **All India Rank 1073** in JEE Mains 2016 - 1.2 million candidates appeared for the exam.

• Placed in the **top 0.04 percentile** in JEE Advanced 2016 (Entrance exam to the prestigious IIT institutions).

SKILLS

Programming

Python • C++ • MATLAB • Java • C • C#

ML & CV Libraries

PyTorch • TensorFlow • Keras • Scikit • NumPy • OpenCV • PIL • Darknet • Pandas

CV Applications

Generative Models • Object Detection & Tracking • Depth Estimation

Development Tools

ROS • Unity • Gazebo • Simulink • RViz • Carla • Colab • JSP • CSS

EXTRACURRICULARS

• **Badminton Player, UMD College Park** -

Men's doubles player in the competitive team of the university (Present).

• **Track & Field Athlete, BITS Pilani** - Medal winner in various 100m, 200m, 4x100m and long Jump collegiate events (2016 - 2020).

• **President - PTM, BITS Pilani** - Tamil cultural association of the university (2017-2018).

EXPERIENCE

Renesas North America Ltd. | ARTIFICIAL INTELLIGENCE ENGINEER INTERN

May 2023 – Present | Columbia, MD

- Developed a **SVM based lightweight ML anti-spoofing model**, that can reject spoof inputs in voice authentication systems. ([Scikit](#)) | [LINK](#)
- Working on **embedded deployment** of the model on a Renesas Edge device. ([C](#))
- Involved in **creating Machine Learning and CNN pipelines** for the company's automated AI deployment software. ([Python](#))

UMD Vision & Learning Lab | GRADUATE STUDENT RESEARCHER

Feb 2023 – Aug 2023 | Guide: Dr. Jia-Bin Huang | College Park, MD

- Worked on CLIP based generation of 3D meshes using **GAN Inversion** and **3D-GAN**.

Robert Bosch Centre - IISc Bangalore | ROBOTICS RESEARCH INTERN - REMOTE

Jan 2022 – Aug 2022 | Guide: Dr. Shishir Kolathaya | Bangalore, India

- Implemented a **LIDAR based 3D object detection model** for a level-3 Autonomous Vehicle sponsored by **WIPRO**. ([PyTorch](#))
- Developed a **low-level control package** communicating with the **perception stack** using **Control Barrier Functions (CBFs)** for obstacle avoidance. ([Python](#))
- Verified the controller in an autonomous driving simulator. ([Carla](#)) | [VIDEO](#)

IIIT Bangalore | COMPUTER VISION RESEARCH INTERN - REMOTE

Jan 2022 – Aug 2022 | Guide: Dr. G.N. Srinivasa Prasanna | Bangalore, India

- Utilized a **YOLO** architecture from **Darknet** framework to predict plant leaf count and monitor crop health. ([Transfer Learning](#))
- Involved in **3D modelling** of parts for the farm robot.)
- Mentored five new interns to model an **autonomous robotic assembly line**.

Centre for Robotics & Intelligent Systems - BITS Pilani | UNDERGRAD THESIS

Jan 2020 – Jul 2020 | Guide: Dr. B.K.Rout | Pilani, India

- Successfully defended **thesis** on **DL applications in CV** for **level-3 autonomous vehicles**.
- Implemented and trained a **Bi-Directional LSTM Network** on temporal tracking data to predict the path of pedestrians **1 second** into the future. ([TensorFlow](#), [Keras](#))

KEY PROJECTS

MULTI-MESHER: DIFFUSION DRIVEN 2D TO 3D MESH RECONSTRUCTION | [LINK](#)

A **PointNet** based model which uses a per shape optimization approach alongside single-view to multi-view synthesis using **Zero123** Diffusion model for single image-to-3D generation.

AMERICAN SIGN LANGUAGE DETECTION | [LINK](#)

Implemented a **CNN and LSTM** based American Sign Language (ASL) Detector for Letters from video feeds, and showcased its capability with a custom GUI.

TERPBOT WITH PATH PLANNING AND DYNAMIC OBSTACLE AVOIDANCE | [LINK](#)

Created **TerpBot**, a unicycle model based **autonomous mobile robot**, from scratch, with wheel odometry and one monocular camera for perception. Implemented its planning stack to navigate complex maps using **RRT* global planner**, and evade dynamic obstacles using a **Potential Field based local planner**.

IMAGE COMPLETION USING MASKED AUTOENCODERS FOR PERSPECTIVE SHIFTING | [LINK](#)

Utilized a **multimodal mask autoencoder**, which takes RGB image and depth data of a scene to reconstruct the RGB scene from a different perspective, by completing the occluded patches.

VOLUME RENDERING AND NEURAL RADIANCE FIELDS | [LINK](#)

Implemented a simple **volumetric differential renderer** and a **Neural Radiance Field (NeRF)** for implicit **3D representation and novel view synthesis** leveraging its capabilities.

PUBLICATIONS

- [1] "Control barrier functions in ugvs for kinematic obstacle avoidance: A collision cone approach," *arXiv preprint*, 2022.
- [2] "Analysis of vibration based windmill coupled micromachined energy harvester," *JVE Journals*, 2019.