

SHYAMSUNDAR PRABHAKAR INDRA

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EDUCATION

- University of Maryland** | *Master of Engineering in Robotics* | **GPA : 4.00 / 4.00** Aug 2022 - May 2024
• **Key Courses:** 3D Computer Vision (CV) | Multimodal ML | Adv. Deep Learning | C++ Robot Programming College Park, MD, USA
- BITS Pilani** | *Bachelor of Engineering in Mechanical Engineering* | **GPA : 8.20 / 10.00** Aug 2016 - May 2020
• **Bachelor's Thesis :** CV based Pedestrian Path Prediction using Bi-LSTM for L2 Autonomous Vehicle [\[link\]](#) Rajasthan, India

KEY SKILLS

Python | C++ | CUDA | PyTorch | TensorFlow | OpenCV | Docker | Kubernetes | ROS | Git | Carla | AzureML | AWS | Airflow | ONNX

EXPERIENCE

- KPCS Systems** | *Machine Learning Engineer* Oct 2024 – Present
Summary : Spearheading machine learning & full-stack projects for various high profile clients Fredrick, MD, USA
- Developing a web application with end-to-end ETL pipelines using Airflow & Elasticsearch grabbing data from AWS S3 server; visualization using Grafana dashboards embedded into an Angular + Node.js app, deployed on an AWS EC2 instance.
 - Achieved 93% anomaly detection accuracy using sBERT, fine-tuned Llama 3 & Isolation Forests on National Institute of Health's (NIH) AccessGUDID dataset; It is in the process of getting productionized in NIH's system. [\[github\]](#)
 - Fine-tuned LLaVA 1.5 7B for OCR of scanned question papers, and automating their conversion to LaTeX format.
- Renesas Electronics America Inc.** | *Machine Learning Engineer Intern* Jun 2023 – May 2024
Summary : Specialized in MLOps & developing software for automated AI deployment on Renesas edge devices Columbia, MD, USA
- Built Python backend & automated ML pipelines for Renesas edge AI platform, saving 80+ man-hours/month.
 - Optimized PyTorch edge deployments by reducing memory usage by 42% with LoRA & inference times by 12% via ONNX.
 - Built SVM voice authentication model with 96% accuracy, deployed on Renesas RAG61 boards. [\[website\]](#)
 - Delivered 92.6% accuracy for Deep Learning based surface detection on 4 surfaces for intelligent vacuums. [\[link\]](#)
- UMD Vision & Learning Lab** | *Graduate Student ML Researcher* Feb 2023 – Jun 2023
Summary : Conducted cutting-edge research on generative AI models for text-to-3D facial animation College Park, MD, USA
- Developed 3D text-to-facial animation models using Nvidia's EG3D, GAN Inversion, & CLIP under Dr. Jia-Bin Huang.
 - Achieved realistic facial animation outputs with high CLIP scores for editing accuracy by training on the EmotiW dataset.
- Robert Bosch Centre - IISc Bangalore** | *Robotics Machine Learning Intern* Jan 2022 – Aug 2022
Summary : LiDAR 3D obstacle detection & lower level controller for WIPRO sponsored L3 autonomous vehicle Karnataka, India
- Built LiDAR 3D object detection (mAP: 73% cars, 72% pedestrians) using KITTI3D for an L3 autonomous vehicle.
 - Developed CBF-based controller with 92% collision avoidance success in 50 Carla simulations.
 - Deployed real-time obstacle avoidance on a Copernicus UGV & published findings at Indian Control Conference. [1] [\[video\]](#)

SELECTED PROJECTS

- Vision Language Navigation Foundation model (Ongoing)** | (Python, PyTorch)
Building foundation model with Google's RT-2 backbone; training on 10K+ YouTube clips to improve task accuracy over baseline.
- TerpBot : Autonomous Mobile Robot** | (RaspberryPi (RPI), ROS2, C++, Python, PyTorch) | [\[website\]](#)
Built RPI + ROS2 robot with wheel odometry & monocular camera, achieving 100% navigation success in 5 test environments.
- Multi-Modal Masked Autoencoder Inpainting** | (Python, PyTorch, AI2THOR) | [\[paper\]](#)
Developed transformer-based multi-modal autoencoder for image inpainting using RGB & depth images, tested on AI2THOR.
- Virtual Reality (VR) Hostage Rescue Game** | (Unity, C#, Meta Quest 2) | [\[website\]](#)
Created an immersive VR game simulating a hostage rescue mission for Meta Quest 2 using Unity Engine & C# scripting.
- Multi-Mesher : Single Image to 3D Mesh Generative Model** | (Python, PyTorch, PyTorch3D) | [\[website\]](#)
Designed a novel single images to 3D colored mesh genAI model using SDS loss & synthetic multi-view data from Zero123.
- CUDA based Image Processing Pipelines** | (CUDA, C++, OpenCV) | [\[github\]](#)
Optimized image processing with CUDA, achieving over 6x speedup over CPU for Gaussian Blur, Sharpening, Edge Detection etc.

PUBLICATIONS

- [1] "Control Barrier Functions in UGVs for Kinematic Obstacle Avoidance: A Collision Cone Approach", *Indian Control Conf.* 2023.
- [2] "Analysis of Vibration-based Windmill Coupled Micromachined Energy Harvester", *Journal of Vibroengineering*, 2019.