Uday Girish Maradana

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Education

- **MS in Robotics Engineering** — *Worcester, MA (USA)*
  Worcester Polytechnic Institute , GPA: 4.0 — *Aug 2023 – May 2025 (Exp)*
- **B.Tech Mechanical Engineering** — *Kerala, India*
  National Institute of Technology, Calicut — *Jun.2015 – May.2019*

Work Experience

- **Graduate Researcher - ELPIS Lab** *(Jan 2024- Present),USA*
  - Working on improving Robot grasping with End-End reinforcement learning combined with vision.**Advisor:** Prof. Constantinos Chamzas.
- **Graduate Researcher - Perception and Autonomous Robotics Group** *(Aug 2023 - Feb 2024),USA*
  - Worked on improving current optical flow pipeline for Aerial vehicles to detect unknown scenarios and able to navigate using optical flow. **Advisor:** Prof.Nitin J Sanket
- **Machine Learning Engineer (Sr.Engineer) - Tiger Analytics** *(Jan 2022 - Jul 2023), India*
  - Assisted organization in obtaining Google Cloud ML Specialization certification by gathering proof and delivering a 4-hour technical presentation on their behalf.
  - Led a team of 3 ML Engineers in creating an End-to-End retrainable MLOps pipeline with AWS.
  - Led a team of 4 ML Engineers in orchestrating and automating the training and inference pipeline deployment for a Price Elasticity Model using MLOps principles on GCP.
  - Contributed to the MLOps team in developing a Real-time Scalable and Automated Pipeline for Anomaly Detection in Authentication systems within the field of Cybersecurity.
- **Freelance ML Engineer/Data Scientist** *(Aug 2021 - Jan 2022), India*
  - Developed a News Recommendation system Pipeline on Vertex AI for CodeRythm Technologies.
  - Developed components for the Information extraction platform for a Legal AI product at DeepJudge.
  - Analyzed data from a Retail Fashion Business client at Aays Analytics, constructing a pipeline for Automated Scheduling and inventory management using ML Modelling.
  - Developed an ML-based API at Applied Computing for Virtual KYC automation, utilizing Cloud Text extraction APIs, OpenCV, and NLP libraries to identify keywords.
- **Machine Learning Engineer II - New Space Research Technologies** *(Feb 2021 - Jul 2021), India*
  - Developed a Deep learning-based Targeting and Navigation platform utilizing feature matching algorithms like Superpoint, LoFTR, and SuperGlue.
  - Led the exploration of shifting the current inference platform from Raspberry Pi to CUDA-based platforms to enhance platform inference speed in the Platform Shift project.
- **Machine Learning Engineer - Quantiphi Analytics Solutions** *(May 2019 - Feb 2021), India*
  - Contributed to the Solutions Research / POC Team, enhancing the firm's capabilities in Hybrid deployment scenarios. Projects involved analyzing Television videos with Google Cloud AI-based APIs for character/sentiment impact on viewership, creating an AI-based Gym Assistant, and managing Web Page and Doc Translations using Google APIs and a Custom Open Source Deep learning approaches.
  - Developed a scalable package for NLP related tasks to deploy and benchmark performances of Roberta,OpenGPT-2,Longformer.
  - Implemented a CV pipeline for Person Re-Identification and security, integrating DL concepts like Object Detection, Tracking, Person Re-identification, and Image Search using FAISS and Elastic Search.
  - Developed a Computer Vision pipeline for safety in parks and resorts, incorporating deep learning concepts such as Object Detection, Tracking, and Pose Estimation and deployed using TensorRT/Triton.
- **Machine Learning Intern - Storilabs System Technologies** *(Jun 2018-Oct 2018),India*
  - Implemented a Computer Vision pipeline for real-time Object Search, enabling the identification, live tracking, and historical tracking of objects across multiple locations.

Publications

- Aniket Patil, Mandeep Singh,Uday Girish Maradana,Nitin J. Sanket "MinNav : Minimalist Navigation Using Optical Flow For Active Tiny Aerial Robots (Under Review - RA-L)" Website Video.
- Uday Girish, M et.al."RIGGU: A Semi-humanoid Robot Platform for Speech and Image Recognition" in Intelligent Systems, Technologies and Applications, 2020 Paper Video.

Skills

- **Languages**: Python, C, C++, SQL, HTML, R
- **Softwares/Frameworks/ Technologies**: Cloud Computing(GCP, AWS,Azure), CV, NLP, RL, Robotics, Edge Computing, Speech Tech, Network Security, Quantum Computing, Databases, Microservices, Tensorflow, OpenCV, Scikit-Learn, Pytorch, CUDA, cuDNN, ROS, Deepstream, Matlab, COMSOL,SolidWorks, Ansys,FluidSim, CREO, MasterCam, Proteus, Unity, Blender,Octave, Arduino, Edge Devices, GitHub, Jenkins, ARM, Gazebo, OpenAI Gym
- **Soft Skills**: Leadership, Project Pitch, Technical Presentations.

Projects

- **SfM and NeRF**: Classroom Project on CV aims to build traditional Structure from motion pipeline from scratch and comparing with the latest deep learning variants such as Neural radiance fields.
- **Panorama Stitching**: Classroom Project on CV aims to stitch images by using Traditional methods and DL (Supervised and Unsupervised homography - Spatial Transformer and DLT) based methods.
- **3 Link Manipulator Analysis**: Evaluation of a 3 link planar manipulator Kinematics and Dynamics to understand specifications and recommend actuators such that it can execute certain trajectories.
- **Indoor Robot Navigation**: Evaluation of Traditional algorithms such as RRT, RRT* with Reinforcement learning based end to end action based methods for Indoor Robot navigation in Habitat Environment.
- **Alien Catcher**: Evaluation and implementation of different control algorithms such as PID, LQR for catching unidentifed flying objects in flying space with a quadrotor in simulation.
- **Computer Vision for Movement measurement in Ultrasound Videos**: Research on Traditional and Deep Learning based Optical flow methods to track key particles movement in Ultrasound Medical videos.
- **Knee Arthroscopy Surgery Tool powered by CV**: Using Computer vision and Traditional Image processing to get a real-world transformation of the measurement made in an Image. Using Detectron2 for Segmentation and Traditional CV + Shortest distance-based approaches for Contour Detection and matching.
- **Autonomous Bot-v1 using DL and ROS**: Development of an Autonomous bot using ROS, Object Detection, Lane Detection, and path planning using Jetson Nano, RPI4 with a night vision capability.
- **Auto Ticket Generation using Real time Transcription**: Developed a Workflow that can integrate with the current Call Center AI and enable Auto ticket generation with real-time speech-to-text transcription, NLP.
- **Anonymization tool for Surgical Videos**: Developed a Web UI using streamlit powered by ML backend, which supports multiple model integrations to anonymize different objects in a video.
- **Label Studio ML backend Integration - Auto Labelling**: Integrated Label Studio with ML-powered backend for Auto labeling. This solution is then deployed on Cloud for a client to enable faster labeling.
- **Multi Class Image Classification with Deployment**: Tuned different SOTA models, developed a few custom CNN architectures for Multi-class Image classification on the Cdiscount dataset(5000 categories), and deployed it on the cloud with Streamlit UI. This work is a part of the thesis coursework of PGD-AI/ML.
- **Knee Rehabilitation System**: Fabrication of a device with a 2 DOF mechanism which can be used for performing Flexo-extension exercises which can be used for Knee rehabilitation purposes.
- **RIGGU V2-The Semi Humanoid**: A complete framework for developing an Interactive Semi-Humanoid Robot using technologies like CV, NLP, ROS, and SLAM.
- **Quadcopter,Hexacopter**: Autonomous Quadcopter based on PixHawk Flight controller integrated with a Raspberry Pi. Hexacopter based on ARM and equipped with manual control and PID tuning was done for stability.
- **Robocon Bot-ABU Robocon 2017**: A manual robot that can throw disks at specified positions made by our Robotics Interest Group for Robocon-2017. I was involved in the development of thrust mechanics and control.

Certifications/Courses

- **Certifications**: GCP Professional ML Engineer, AWS ML Speciality, Tensorflow Developer Certificate, GCP Cloud Associate Engineer, AWS Associate Solutions Architect, PG Diploma - AI and ML
- **Courses**:Control Systems, Introduction to Robotics, Image Processing, Genetic algorithms, Machine Learning, Deep Learning, Motion Planning, Computer Vision, Robot Control, Robot Dynamics, Swarm Intelligence, Reinforcement learning, Tensorflow Data Specialization, Self Driving Nanodegree.