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*
  - **RL for Grasping** : Working on improving Robot Grasping with End-End Reinforcement learning. **Advisor:** Prof.Constantinos Chamzas
- **Graduate Researcher - Perception and Autonomous Robotics Group** *(Aug 2023 - Feb 2024),USA*
  - **Optical flow based navigation for Aerial vehicles**: 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 - Tiger Analytics** *(Jan 2022 - Jul 2023), India*
  - **GCP ML SPOC**: Helped organization to gain Google Cloud ML Specialization certified by organizing evidence and finally giving a final 4 hour technical presentation on behalf of the organisation.
  - **MLOps Pipeline - AWS Sagemaker**: Led a team of 3 ML Engineers to design an End-to-End retrainable MLOps pipeline with Sagemaker and AWS Services.
  - **MLOps Pipeline Dev -Price Elasticity Model**: Led a team of 4 ML Engineers in orchestrating and automating the training and inference pipeline deployment following MLOps principles on GCP.
  - **Anomaly Detection Pipeline - Cybersecurity**: Worked as a part of the MLOps team to develop a Real-time Scalable and Automated Pipeline for Anomaly Detection in Authentication systems.
  - **Cloud IOT + ML Exploration - Internal POC**: Led the development of a Hybrid IOT architecture for easier integration with sensors and Real life Edge Deployment of ML Models on Microcontrollers using Open Source SDK's and Tiny ML.
- **Freelance ML Engineer/Data Scientist** *(Aug 2021 - Jan 2022), India*
  - **CodeRythm Technologies**: Developed a News Recommendation system Pipeline on GCP using Vertex AI.
  - **DeepJudge - Aug 2021-Jan 2022**: Worked on developing multiple components for the Information extraction platform for the Semantic search component of a Legal AI product.
  - **Aays Analytics - Aug 2021- Jan 2022**: Analysed the data from a Retail Fashion Business client and built a pipeline for Automating Scheduling and managing inventory using ML Modelling.
  - **Applied Computing - Sep 2021- Nov 2021**: Developed an ML-based API that can help in Virtual KYC automation with the help of Cloud Text extraction APIs, OpenCV, and NLP libraries to identify keywords.
- **Machine Learning Engineer II - New Space Research Technologies** *(Feb 2021 - Jul 2021), India*
  - **Targeting and Navigation Platform**: Developed a Deep learning based Targeting and Navigation platform using Deep learning based feature matching algorithms such as Superpoint, LoFTR, SuperGlue.
  - **Platform Shift- RPI to Jetson NX**: Led the exploration of shifting the current inference platform which is Raspberry Pi to CUDA based platforms to speed up the platform inference
- **Machine Learning Engineer - Quantiphi Analytics Solutions** *(May 2019 - Feb 2021), India*
  - **Solutions Research & POC Team**: Worked in a team to develop firms' capability in Hybrid deployment scenarios, using Nvidia SDK such as Deep Stream, TLT, Clara, TFlite, and OpenVino.POC Projects include working on Television videos using google cloud AI-based APIs and analyzing the impact of characters/ sentiment in the videos with the viewership, AI-based Gym Assistant, Web Page, and Doc Translations using Google APIs and Custom approach.
  - **NLP- Transformer related script development**: This project involves developing a scalable script to deploy OpenGPT-2/Roberta/Longformer in a Kubeflow-based pipeline and benchmark the model performance.
  - **Computer Vision for Person Re-Identification**: CV pipeline for Re-identification and security. This project involves working on deep learning concepts such as Object Detection, Object Tracking, Person Reidentification, and Image Search using FAISS and Elastic Search.
  - **Computer Vision for Safety**: CV Pipeline for Safety in Parks, Resorts, etc. This project involves working on DL concepts such as Object Detection, Tracking, and Pose Estimation and deploying them using the Triton Platform.
- **Machine Learning Intern - Storilabs System Technologies** *(Jun 2018-Oct 2018),India*
  - **Computer Vision Pipeline for real-time Object Search**: CV Pipeline for Real-time object search is for identifying and live tracking of objects across multiple places and also tracking the history.

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
- **Technologies**: Cloud Computing(GCP, AWS,Azure), CV, NLP, RL, Robotics, Edge Computing, Speech Tech, Network Security, Quantum Computing, Databases, Microservices
- **Softwares/Frameworks**: 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

- **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

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