# KUMARA RITVIK ORUGANTI

College Park, Maryland | okritvik@gmail.com | +1-(240)-733-7110

https://www.github.com/okritvik | https://www.linkedin.com/in/okritvik/ | www.okritvik.com

**PURPOSE:** To obtain a position as an embedded firmware engineer and contribute my expertise and knowledge towards creating efficient and innovative solutions with a focus on developing sustainable systems, utilizing path planning and intelligent models for robotics and multi-agents.

## EDUCATION

- **Master of Engineering in Robotics** | GPA: 3.97/4.0 **May 2023**
  **University of Maryland,** College Park
  **Relevant Course Work**: Software Development for Robotics, Microprocessor Based System Design, Autonomous Robotics, Multi Robot Swarms, Computer Vision, Deep Learning, Path Planning, Robot Modeling, Robot Control
- **Bachelor of Technology** in **Electronics and Communication Engineering** | GPA: 8.65/10 **Sep 2020**
  **Keshav Memorial Institute of Technology**, Hyderabad
  **Relevant Course Work**: Signals and Stochastic Processes, Embedded Systems, Analog and Digital Communication, Analog and Digital IC Circuits, System Theory and Logical Design

## SKILLS

- **Programming Languages:** C++, Structured Text, Python, C#, Java, Embedded C, Matlab, Verilog, System Verilog, Go
- **Tools:** Altium Designer, Gazebo, RViz, ROS, Arduino IDE, SolidWorks, Eclipse, Code Composer Studio, Visual Studio, Git, TDD, Agile, Logic Analyzers, Xilinx Vivado, Azure Dev Ops, JIRA, Atlassian BitBucket
- **Operating Systems**: Windows, Linux, MacOS, RTOS

## WORK EXPERIENCE

**Embedded Software Engineer (SDE-2) | The Raymond Corporation** **Jul 2023 – Present**

- Part of the Autonomous New Product Development Team.
- Contributed to several software releases that involved debugging and fixing rarely occuring major issues during rigorous testing.
- Authored a feature from design to development that improves the performance of the Autonomous Fork Lift Truck by 60%.
- Refactored major functionalities of the product code-base, majorly concentrating on readablity, modularity and repeatability.
- Involved in finding the bugs by using root cause analysis and actively participating in discussions with cross-functional teams.
- Suggested several improvements that prevented major bugs in the software.
- Working with partner company on integrating vision system for load handling.
- Developed a feature that checks for calibration accuracy of the cameras due to wear and tear.
- Added a new functionality to a tool that analyzes files and lets other technical teams modify the product internal parameters.

**Open Source Contributor | Sorrentum Inc.** **Feb 2023 – May 2023**

- Majorly involved in developing an **NLP Model** for estimating the large **movement of assets in crypto** market.
- Worked as a bridge between the core team and other individual contributors by distributing the tasks among the developers according to their skillset.

**Graduate Grader | Maryland Applied Graduate Engineering** **Jan 2023 – May 2023**

- Grader for the **Perception for Autonomous Robots** course by Dr. Samer Charifa for Spring 2023. Supporting students in their learning by evaluating projects, providing feedback, clarifying doubts, and creating assignments.

**Research Assistant | Maryland Robotics Center** **Sep 2022 – May 2023**

- Worked under Dr. Derek Paley on Virtual Control of SPOT robot using DVPG Network, Air and Ground Vehicle collaboration for Search and Rescue operations | Collaboration with UMBC and Army Research Lab

**Robotics Success Tutor | University of Maryland** **Jan 2022 – Dec 2022**

- Tutor for the undergraduate Robotics and Autonomous Systems minor courses, **ENAE 450 – Robotics Programming, ENEE 467 – Robotics Project Laboratory, ENAE 380 – Flight Software Systems,** and **ENME 480 – Introduction to Robotics**.
- Hosted weekly office hours to help students develop, program and debug real-world robotics projects as a part of their coursework.

**Software Developer Associate | Teleparadigm Networks, Hyderabad, India** **Aug 2020 – Jul 2021**

- Designed control circuit, GUI, and Algorithmic Flow for ***3D Printed*** **Microscopic Whole Slide Scanner** for biopsy slides | (IP Technology)
- Mentored a **Google Summer of Code** developer on Integrating Microscopic Stage and a Camera | Collaboration with Food and Drug Administration, US
- Designed **IoT Starter Kit** for sophomores of Keshav Memorial Institute of Technology, India, and exported the kits to the underprivilized students in South Africa for training purposes. | Altium Designer, Schematics, PCB Design
- Developed a **Real-time Light Intensity Detection Module for Liquid Biopsy Samples** | Raspberry Pi, MATLAB

## INTERNSHIPS

**SoC Design Verification Intern | Sion Semiconductors, Hyderabad, India** **Jul 2019 – Feb 2020**

- **Designed modules** for counters, flip flops, **UART** and **I2C** Communication protocols | Verilog, System Verilog

**Summer Intern | Indian Institute of Technology, Bombay, India** **May 2018 – Jul 2018**

- **Interfaced GPS** module with Texas Instruments microcontroller and processed data for **Ground Penetration Radar |** Data and Signal Processing
- Developed programs for **ADC, DAC, SPI**, and **UART** Communication for 8051 microcontroller using Scilabs IDE

## CERTIFICATIONS

- **TRIZ – Level 1** | The International TRIZ Association, 2021
- **Oracle Certified Associate – Java SE8 Programmer** | Oracle, 2019

## PROJECTS

- Worked under the guidance of Prof. Ratnesh Tiwari, Department of Mechanical Engineering, University of Maryland, on developing a **Gstreamer Pipeline for real-time inferencing** of Drone video data. Deployed **YOLOV4 Tiny** model to achieve **24 fps** with **one second delay** over the network on Jetson Nano | Jetson, Python, Wireless Data
- Analysis of **Semantic Segmentation of Ground Plane** for Smart Wheel Chairs using MobileNet, ResNet and EfficientNet models. Reduced training time by 95% by utilizing the techniques of data augmentation and EDA and deployed the models on custom built robot | Python, TensorFlow, Jetson TX2, Pytorch Lightning, OpenCV, Raspberry Pi, RPi Camera, Teleoperation
- **MARIO-COM –** A mobile autonomous robot that simulates the collection of medical waste in biohazardous environment | C++, ROS2, Gazebo, Rviz, Googletest, GitHub CI, Integration Testing, Codecov, Agile Iterative Process
- **Autonomous Robot** for transporting specific objects in cluttered environment | Raspberry Pi, Arduino, OpenCV, Python, IMU, SONAR, Actuators
- **Inverse Kinematics Path Planner for KUKA Manipulator |** C++, Unit Testing, GitHub CI, Coveralls, Agile, Test Driven Development
- **Frontier Based Coverage using Multiple Agents** to develop a map in a decentralized, resource limited and communication restrictive environment by following the principles of Boids Algorithm for Swarm Formation | Python
- **Lane Detection**, **Image Stitching**, **K-Means Clustering**, **Cube Projection on AR Tag** and Depth Estimation using Stereo Vision | Python, OpenCV
- **Path planning** for a TurtleBot3 Robot using **Dijkstra, A* and RRT*** algorithms. Addressed the problem of dynamic obstacles by using the Multi Objective model for path planning | Python, ROS, Gazebo, OpenCV
- **Autonomous Colored Object Detector and Follower Robot** | Pixy cam, Arduino, and Raspberry Pi, SPI and UART
- Designed circuit and PCB for **Automatic Head Light Dipper |** 555 Timer, Altium Designer

## LEADERSHIPS

- **Club Head |** AALAP – KMIT's Music Club, Hyderabad, India **Jan 2019 – Jul 2020**
  Started as a senior advisor and became the club head within two months – managed nearly 39 students from different musical backgrounds, enhancing collaboration and team spirit
- **Students' Council Member |** KMIT, Hyderabad, India **Jul 2019 – Jul 2020**
  Worked closely with the President of the Student's Council to formulate rules and regulations, collaborated with Organizing Committee and Public Relations team to conduct musical events. Played a crucial role in music auditions for the events.