Vikram Raj Nagoor Kani

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EDUCATION

University of Illinois Urbana Champaign — Urbana, IL
Master of Engineering in Autonomy and Robotics — *Aug 2024 - present*

BS Abdur Rahman Crescent Institute of Technology — Chennai, India
Bachelor of Technology in Electronics and Communication Engineering — *Jul 2017 - Jun 2021*

WORK EXPERIENCE

Machine Learning Engineer Intern, *UIUC College of Veterinary Medicine* — *Jun 2025 - present*
- Conducting a **comparative analysis** of **SOTA pose detection models** trained on currently available swine datasets to evaluate their ability to detect keypoints in a generalized swine dataset collected from diverse farm environments.

Robotics Machine Learning Engineer Apprentice, *Kohler* — *Jun 2025 - present*
- Developing a light weight **instance segmentation model** to verify the presence of product parts during the packaging stage, integrating it into the overall defect inspection workflow.

Robotics Machine Learning Engineer Intern, *UIUC College of Applied Health Sciences* — *Jan 2025 - May 2025*
- Reduced VRAM usage from 12GB to 7GB by optimizing the **multimodal deep learning** pipeline for **STRETCH Robot AI**, enabling compatibility with **low-end GPUs**.
- Improved the reliability and safety of elderly-assistive object pick-and-place tasks, **doubling** the pickup **success** rate from **20% to 40%**.

Automation Engineer, *Accenture* — *Aug 2021 - Jul 2024*
- Implemented **CI/CD pipelines** for provisioning and managing **Docker Containers**, **Azure Cloud** and **BareMetal servers**, **reducing manual** setup and maintenance effort by up to **60%**.
- Evaluated **cognitive vision models** on **IoT edge** servers to assess their accuracy in detecting and reporting faulty surveillance cameras at Microsoft data centers.

Embedded System Engineer Intern, *Nokia* — *Feb 2021 - May 2021*
- Developed an **IoT device** to **detect obstacles** blocking accessibility of fire extinguishers and alert security in **real time** for Nokia's Manufacturing Factory as part of their safety measures.

PROJECTS

F1Tenth Robust Navigation using LiDAR and Camera
ROS, Python, Open CV, NVIDIA Jetson, F1 Tenth, Unity, Linux
- Introduced a **light weight** lane detection algorithm using **OpenCV**, optimizing **computational speed by 30%** on **Nvidia Jetson** for **real-time waypoint generation** and accepted as **open source contribution** for UIUC ECE 484.
- Developed a **photorealistic digital twin** of the **F1TENTH** car and environment using a Unity-based open-source simulator, enabling testing and validation with **minimal sim-to-real gap** and accelerating development.

6-DOF Robot Arm Pose Prediction Using Deep Learning
PyTorch, Python, OpenCV, ResNet, YOLO
- Developed a **deep learning model** to predict **6 Degrees of Freedom** for **robotic arms** to pick up warehouse parts. Using a combination of RGB and Depth images in a **dual-stream U-Net** architecture with hybrid **feature fusion**.
- Developed a **custom data loader** and image augmentation pipeline to convert BOP dataset format to YOLO format for seamless integration with YOLO-based models.

Persistent Pedestrian Detection Using Sensor Fusion
GEM E4, PyTorch, ROS, Python, Open CV, YOLO, GEMStack
- Developed **persistent pedestrian detection algorithm** utilizing camera and LiDAR data from GEM e4 vehicle optimized for **real-time systems** by implementing techniques like **voxel down-sampling** reducing time complexity.

Digital Image-to-Drawing Replication Using UR3e Robot Arm
UR3, ROS, Python, Open CV
- Developed an **OpenCV-based pipeline** to detect and refine image contours, **preserving key features** while **reducing waypoints** to improve robotic drawing speed.

PUBLICATIONS

Design of Restaurant Service Robot for Contact less and Hygienic Eating Experience — *IRJET 2020*
***VIKRAM RAJ.N**, Prejitha.CT, Harshavardhan Vibhandik, et al.*
- Published a paper on theoretical working model of a robot working in a restaurant to prevent spread of COVID-19.

TECHNICAL SKILLS

Programming Languages : Python, C++, Bash, PowerShell, LabView, Matlab, Azure CLI.
Technologies/Frameworks : Pytorch, Open CV, ROS, ROS2, Docker, Roboflow, Anaconda , NVIDIA Jetson, GEM E2, GEM E4, F1Tenth, Azure, Gazebo, Gazebo Ignition, Unity, Git, Linux, YOLO, MASKRCNN, HRNet, Dino, Detic, SigLIP, Open AI Gym, Deep Learning, Machine Learning, UR3e, CI/CD, SAM, Transformers, ResNet, FANUC.
Coursework : Principles of Safe Autonomy, Deep Learning with Computer Vision, Autonomous Vehicle System Engineering.