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# Omkar Nadkarni

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## SKILLS

- **Programming** - C++ (17, 20), Python, CUDA, QML
- **Computer Vision** - Object Detection and tracking, 3D reconstruction, Pose Estimation
- **CV Libraries** - TensorRT, CuDNN, Tensorflow, Pytorch, OpenCV, Triton Inference Server.
- **C++ Libraries** - Qt, Boost, Poco, STL, GStreamer
- **Networking** - TCP, UDP, REST API, wireshark, postman
- **Optimization & Systems:** Multithreading, IPC, System design, Linux, Windows
- **Soft Skills** – Leadership, Initiative, Reliability, Determined

## EXPERIENCE

### Mark Roberts Motion Control, U.K

Software Engineer - Computer Vision

September 2021 - PRESENT

Developing AI-driven automation solutions for real-time object tracking in sports and broadcasting

- Developed software products for effective control of robots using C++17, Qt and Python.
- Optimized real-time object detection pipeline by upgrading from Yolov4 to Yolov9 and leveraging OpenCV for efficient image preprocessing, improving detection accuracy by ~20% and improving frame rate from 10 to 20 fps by leveraging cuDNN and TensorRT for deployment on GPU-accelerated edge computing devices.
- Engineered a multi-camera horse detection and tracking system by projecting 2D detections into 3D floor coordinates using geometric projection techniques. Calculated overlapping regions across multiple viewpoints to accurately localize and maintain tracking of targets, even in cases of occlusion or camera dropout.
- Developed UI applications using Qt and MFC, integrating real-time visualization tools for tracking systems in broadcast automation. Enhanced user interaction while reducing human errors by streamlining workflows.
- Implemented high-throughput interprocess communication (IPC) using Boost library in C++ to transmit image and detection data across processes, enabling concurrent processing of up to 10 live video streams under memory-constrained environments.
- Upgraded CI/CD pipeline in Bamboo to support CMake + Conan workflows, enabling automated builds, tests, and deployment with artifact versioning for production releases.
- Implemented TCP and UDP communication protocols to enable fast, real-time data exchange with third-party client software, ensuring low-latency and reliable communication for time-sensitive applications.

## **Ottonomy IO, India**

*Autonomous Robotics and AI intern*

*May 2021 - July 2021*

Developing Navigation system for autonomous delivery robot navigation

- Conducted a performance comparison of various object detection models (e.g., EfficientDet, YOLO) for road sign detection and recognition using publicly available datasets, utilizing Python and PyTorch to optimize model accuracy.
- Implemented EfficientDet model using tensorRT in Python for deploying on Nvidia Jetson boards thus reducing latency by 86% and achieving real-time performance.
- Implemented road segmentation, enabling the autonomous system to differentiate between sidewalks and roads for safer navigation.

## **EDUCATION**

### **Queen Mary University of London, London, United Kingdom**

*MSc Artificial Intelligence (Grade: Distinction)*

*September 2019 - September 2020*

Relevant modules: Advanced Robotic Systems, Deep learning and Computer Vision, Neural networks and NLP, Data Science.

### **Dhempe College of Arts and Science, Goa, India**

*BSc Computer Science (Grade: Distinction)*

*September 2016 - September 2019*

Relevant modules: Android Development, computer networks and security, Web Development.

## **PROJECTS**

### **Drone Detection and Tracking System [[paper](#)]**

*(MSc project)*

- Developed a real-time drone detection system using YOLOv4 in Python and Pytorch, ensuring high-speed inference for surveillance applications.
- Improved location invariance by implementing mosaic data augmentation and color transformations, enhancing model robustness.
- Reduced false positives from birds and lamp posts by expanding the training dataset with diverse background objects.
- Achieved a significant improvement in detection accuracy, optimizing for real-world deployment in sensitive areas.