Muhammad Zeeshan Karamat

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Education

Bachelor of Electrical Engineering Sept. 2017 – June 2021

School of Electrical Engineering and Computer Science (SEECS) *CGPA 3.56/4.00*
National University of Sciences & Technology (NUST), Islamabad, Pakistan

- Final year Project: "Whole Slide Image Scanner with Deep Learning Applications"

Technical Skills

Languages: C/C++, Python, Qml, SQL, MATLAB, JavaScript, HTML/CSS
Frameworks/Platform: ROS, PyTorch, Keras, fast.ai, OpenCV , Qt, CMake, CUDA
Development Tools: Linux, Git, Amazon Web Services, Jupyter Notebook, Anaconda, Google Colab, Qt Creator

Experience

Software Engineer II Aug. 2023 – present

vResolv LLC

- Led an AI project focused on fish detection, training and optimizing the Yolo v7 model for improved inference.
- Implemented Deepstream nvdcf for real-time object tracking and deployed the model on Jetson Orin.
- Set up docker and integrated gstreamer pipeline with opencv for gpu based h264 encoding.
- Developed custom Qt-based Linux application plugins, enhancing user interaction and integrating a user-friendly graphical interface with live camera output.

Software Engineer Jan. 2023 – Aug. 2023

Conntac GmbH

- Development of Self Service Andriod and IOS app using Qt in Qml and C++
- Collaborated closely with the design team to translate design specifications into interactive user interface (UI) pages using QML DelegateModels
- Designed and developed the router login feature using camera scan with the Google ML API, enhancing user authentication convenience.

Development Engineer Aug. 2021 – Dec. 2022

Sedenius Technologies subsidiary of Sedenius Engineering GmbH

- Research and Development of Autonomous Vehicle project "ABSOLUT"
- Development of Sensor Fusion algorithm for LIDAR, RADAR, and Vision data based on Kalman Filter.
- Development of ROS node for Object Detection, and Tracking and deployed on NVIDIA DRIVE AGX.
- Development of modules and user interfaces for Sensor-Data-Visualization and simulation software

Projects

Whole Slide Image (WSI) Scanner with Deep Learning Applications

"Final year thesis" [Demo] [Github] [Thesis]

* Developed end-to-end automated robotic machine to digitize pathological slides for AI-based analysis.
* Implemented an algorithm for the automated scanning of slides using actuators and a controller.
* Designed an Autofocus algorithm based on edge detection and integrated it with the scanning algorithm.
* Developed Image stitching algorithm in Python based on cross-correlation and Laplacian blending.
* Designed a Graphical User Interface to make the scanner user-friendly in python
* Trained a YOLOv4 object detection model to detect Mitotic cells and acquired 92.29% mAP.

Agricultural Robot for Precision Spraying

* Developed autonomous robot for precision spraying using computer vision based on ROS
* Trained a classifier to calculate the density of plants based on the area covered by leaves.
* Fed the density value to the controller which controls the amount of spray based on an algorithm.

Vision Based Smart Security System [Demo]

* Designed an intrusion detection system using the knowledge of embedded systems and Computer Vision.
* Trained a model for intrusion detection and optimized inference using TensorRT SDK for Jetson Nano
* Integrated GSM module and PIR sensor with Jetson device and generated alarms in form of calls
* Designed REST API to communicate with the company app.

Honours and Awards

- Rector Gold Medal Award among the batch of 200 students
- Distinction at International level during SDURI program conducted by University of Western Australia
- Certification from Nvidia for Jetson AI specialist
- Full Merit Scholarship at Pakturk International College