MUHAMMAD ZEESHAN KARAMAT

+923215332331 | mkaramat.bee17seecs@seecs.edu.pk | linkedin.com/in/mzeeshankaramat

EDUCATION

Bachelor of Electrical Engineering with minor in CS　　　　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

- Courses: Computer Vision, Probability and Statistics, Linear Algebra, Multi-variable Calculus, Numerical Methods, Object Oriented Programming, Data structures and Algorithms
- Final year Project: "Whole Slide Image Scanner with Deep Learning Applications"

Higher Secondary School Certificate (HSSC)　　　　Mar. 2015 – Feb 2017

Pakturk International College, Islamabad, Pakistan　　　　*Percentage Marks: 91.5%*
- Major subjects: Mathematics, Physics, Chemistry

Secondary School Certificate (SSC)　　　　Mar. 2013-Feb 2015

Fauji Foundation Model School, Islamabad, Pakistan　　　　*Percentage Marks: 93%*

EXPERIENCE

Junior Development Engineer　　　　Aug. 2021 – present

Sedenius Technologies Pvt Ltd
- Worked with the team of developers from Germany on Absolut Project
- Implemented algorithm for sensor fusion based on ROS in C++.
- Worked on NVIDIA DRIVE to test sensor fusion with real-time data from sensors
- Worked on Carmaker to implement sensor plugins for ROS

Research Assistant　　　　May 2019 – Jan 2021

Signal Processing and Machine Learning (SIGMA) Lab in collaboration with TUKL
Deep Learning Lab, SEECS, NUST, Islamabad, Pakistan

- Worked as a research intern on multiple projects of Machine learning and embedded system
- Completed Machine learning and Deep learning specialization courses from fast.ai and Coursera
- Built first prototype of automated electrical scanning system for acquisition of Bio-medical images, using 3D printed structure and electronic circuit.
- Automated the scanning process by programming microcontroller and interfacing with stepper motors
- Implemented real-time auto-focusing algorithm using OpenCV in Python, used Laplacian filter as a focus metric. Integrated algorithm with stepper motors circuitry
- Worked in the domain of AI on Edge Devices, implemented SOTA Deep learning models in PyTorch on NVIDIA's Jetson Nano 4GB and 2GB kit and compared performance metrics
- Implemented trained Neural Network on STM ARM-CORTEX M4 discovery board using online available resources including CMSIS-NN library provided by ARM developers
- Mentored new batch of SIGMA interns and evaluated their projects

Deeplearning Intern　　　　June. 2021 – Aug. 2021

University of Western Australia
- Worked on the classification of synthesized images of galaxies from computer simulations using deep learning
- Arranged and conducted talks of speakers during the internship program
- Lead the team of interns in different cross culture activities.

Artificial Intelligence Intern　　　　Aug. 2020 – Dec. 2020

Ieng Group
- Worked in a team of engineers to design a Security System for Telecommunication sites.
- Collected data on different sites and experimented with different classification and object detection models
- Integrated AI system with GPS module and IP camera to provide real time intrusion detection
- Lead the installation team to install product on sites for testing

CERTIFICATES

- Jetson AI specialist by Nvidia
- Machine Learning Course by Stanford University
- Deeplearning Specialization by Deeplearning Ai
- Practical Deeplearning Fast Ai

Projects

Whole Slide Image (WSI) Scanner with Deep Learning Applications   Nov 2020 – June 2021
"Final year project"
* Developed end-to-end WSI scanner to generate Whole Slide Images in digital form and to perform Artificial Intelligence based analysis on resulting images.
* Designed CAD model of automation assembly that consists of 3D printed gears and motor holders
* Designed schematic and PCB of Embedded and Electronic circuitry in EAGLE for electrical module of scanner
* Assembled stepper motors with ramps and microcontroller to scan the physical slides using our scanning algorithm and to capture frames.
* Designed Autofocus algorithm based on edge detection and integrated with the scanning algorithm
* Developed Image stitching algorithm in Python using OPENCV, Numpy and scikit-learn libraries. Used cross-correlation and Laplacian blending to acquire comparable results with open source stitching software
* Designed a Graphical User Interface in python to make the scanner user friendly
* Trained YOLOv4 object detection model on locally annotated dataset to detect Mitotic cells present in Whole Slide Images. Acquired 94.87% F1-Score on test dataset

Classification of galaxy images from computer simulations using deep learning   June 2021 – Aug 2021
* Trained various models in Pytorch for the classifying ring and non ring galaxies
* Improved the accuracy of models using hyperparameter optimization
* Performed data analysis on large dataset catalog to evaluate the physical properties of ring and non ring galaxies

Base Station Security System   Aug 2020 – Dec 2020
* Designed an intrusion detection system using the knowledge of embedded systems and Computer Vision.
* Generated dataset for detection and trained a light weight model for detection
* Optimized the model for better inference using TesorRT SDK
* Deployed the optimized model on a memory constraint Jetson device.
* Integrated GSM module and PIR sensor with Jetson device and generated alarms in form of calls and messages.
* Designed REST API to communicate with the company app.

Classification of B-Acute lymphoblastic leukemia   Mar 2020 – Aug 2020
* Trained various models in Keras for the classification of B-All benign and malignant cells.
* Improved the accuracy of models using different methods
* Used GANs to generate synthetic images of cells to improve the accuracy of the model.

Technical Skills

Languages: MATLAB, Python, C/C++,CMake, SQL, JavaScript, HTML/CSS
Frameworks: PyTorch, Keras, TensorRT, fast.ai, OPENCV
Development Tools: Linux, Git, Visual Studio, CLion, Jupyter Notebook, Anaconda, Google Colab, QuPath
Libraries: Pandas, NumPy, Matplotlib, Scikit-learn

Honours and Awards

* Rector Gold Medal among the batch of 200 students
* Distinction at International level during SDURI program conducted by University of Western Australia
* Among the first batch of NVIDIA certified Jetson AI specialists in the world
* Best Delegate at Wilderness Based Conference "Markhor"
* Campus Finalist at RB Global Challenge 2019
* Full Merit Scholarship at Pakturk College

Management and Leadership Skills

* General Secretary at Youth Insight
* Organizer at 3RD IAPR SUMMER SCHOOL ON DOCUMENT ANALYSIS
* Director Finance Nust Environmental Club
* Deputy Director Finance Nust Archery Club
* Team member Finance Orientation19
* Director Finance Seecs Farewell19
* Volunteer Helping Hands(HHRD)
* Volunteer at Al Khidmat Foundation

Hobbies

Rock climbing, Camping, Hiking, Cricket, Table Tennis, Archery, Book Reading