

MUHAMMAD ASAD ALI

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EDUCATION

2021 – 2024 **Master of Science in Computer Science**

University of Kaiserslautern-Landau (RPTU), Kaiserslautern, Germany

Specialization #1: Intelligent Systems

Specialization #2: Visualization and Scientific Computing

German Grade: 1.4

2015 – 2019 **Bachelor of Science in Computer Science**

National University of Sciences and Technology (NUST), Islamabad, Pakistan

CGPA: 3.89/4.00 (Rank in class: 2/126)

Final Year Thesis: Automated Gait Recognition: Real-time person identification from camera feeds by their walking pattern using deep learning.

Supervisor: *Dr. Muhammad Imran Malik*

WORK EXPERIENCE

Dec 2021 – **Graduate Research Assistant**

Mar 2024 *DFKI, Kaiserslautern, Germany*

- Multi-view 3D Hand Pose Estimation
- 3D Human Pose Estimation

Nov 2020 – **Research Associate - Deep Learning Engineer**

Aug 2021 *Deep Learning Lab, National Centre of Artificial Intelligence, Islamabad, Pakistan*

- **Information Extraction from Medical Documents:** an end-to-end system for automatic information extraction from medical documents consisting of following modules:
 - **Document Classification:** Combined the NLP features of document text with traditional Convolutional Neural Network (CNN) to improve the performance of document classification
 - **Region Detection:** Medical documents consist of regions such as patient, insurance and physician information etc. I trained an object detection model to localize these regions.
 - **Name Entity Recognition:** Final step in the pipeline was to extract structured information in form of key value pairs, for which, I developed an BERT based entity recognition model for word token classification.

June 2019 –
Oct 2020

Machine Learning Engineer

DCUBE Technologies, Islamabad, Pakistan

- **Table Detection and Structure Extraction** using an end-to-end architecture of Graph Neural Networks (GNNs) and Convolutional Neural Networks (CNNs). I implemented the code for *Deep Splerge* architecture published by Adobe and modified its *merge* model that improved the accuracy.
- **QuickAnnot** tool for horizontal and vertical table annotations. Part of data extraction in tables depends on where the headings of the tables are situated, hence defining Horizontal and Vertical tables becomes increasingly important.
- **Pictogram Detection and Classification** in documents using image processing and deep learning. Our Image processing approach was able to beat the vanilla deep learning approaches in accuracy and speed for the detection. We used ResNet for the classification.
- **Tesseract Wrapper** to recognize chemical names of medicines which contain greek and english letters in a single word as tesseract fails to recognize the words containing multi-lingual letters.
- **UrduOCR** technology that recognizes the machine printed as well as handwritten urdu texts in images accurately and rapidly.

June 2018 –
May 2019

Research Intern - Computer Vision

TUCL-NUST R&D Lab, NUST, Islamabad, Pakistan

- **Address Recognition from Postal Envelopes:** Detecting the envelope in images and localizing the address portion in the envelope
- **Barcode Detection and Decoding** from postal envelope using OpenCV in python.
- **Automated Gait Recognition:** Recognizing a person by its walking pattern using Siamese Convolutional Neural Network.

Nov 2016

Mentorship

NUST ACM Student Chapter, Islamabad, Pakistan

- **Project Assistance Mentorship Program:** Assisted a first year student in his semester project of C Program for basic image processing.
- **Peer-to-Peer Mentorship Program:** Assisted 3 first year students in the Fundamentals of Computer Programming course.

PUBLICATIONS

2021

TabAug: Data Driven Augmentation for Enhanced Table Structure Recognition,

U. Khan, S. Zahid, **M.A. Ali**, A. Ul-Hasan and F. Shafait,

Accepted in ICDAR 2021

ACHIEVEMENTS AND AWARDS

Dec 2019

Chancellor's Silver Medal, For securing second highest CGPA in BS Computer Science.

May 2019

Nominated For NUST Rector's Gold Medal Award, For best final year thesis.

Apr 2019	NUST Rector's High Achiever Award
Nov 2018	National Finalist , Huawei ICT Competition Middle East 2018-19
Nov 2018	Travel Award for KAIST EE Visit Camp , South Korea
Oct 2018	Instructor for C/Python Programming Workshop by ACM, NUST
May 2018	Finalist , FICS'18 (Finding Innovative and creative solutions for society), NUST <ul style="list-style-type: none"> Created a chatbot named "<i>Femnobot</i>" to identify harassers on social media by analyzing the conversations with harassers and generating profiles of harassers at the back-end using Natural Language Processing (NLP). Tools & Technologies used: Python, DialogueFlow, Tweepy, TKinter
Mar 2018	Four Pointer , SECS Recognition Ceremony, NUST <ul style="list-style-type: none"> Received appreciation certificate from the Principal of my department for achieving 4.00/4.00 GPA for two semesters in a row.
2016 – 2019	NUST Merit Scholarship (For 7 semesters in a row)
Dec 2016	Member of Organizing Committee for International Conference on Cyber Security & Digital Forensics (CSDiFo) , NUST, Pakistan
Oct 2015	Best Sumo Wrestling Robot , Lego Robotics competition by Computer Society of Pakistan, NUST

SKILLS

Tools / Frameworks	Pytorch, Tensorflow2.0, Keras, Sklearn, OpenCV, NLTK, spaCy, Tesseract, TKinter, Flask, Selenium, Git, Docker
Languages	Python, C/C++, Java, Matlab
Web Development	HTML5, CSS3, Bootstrap, Javascript, JQuery, Ajax, PHP, NodeJS, ReactJS
Web Pentesting	SQL Injection, Cross Site Scripting (XSS), Cross Site Request Forgery (CSRF), CRLF Injection, HTTP Parameter Pollution. Remote Code Injection (RCE)
App. Development	Expo / React Native
Cloud Services	AWS Comprehend Medical, AWS Textract, Google Cloud's Vision
Domains	Digital Image Processing, Machine Learning, Computer Vision, Document Image Analysis