

# Curriculum vitae

## PERSONAL INFORMATION



## Syed Muhammad Kumail Raza

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## POSITION

## Research Assistant / Student Job

## EDUCATION AND TRAINING

- 09/2018–Present **European Masters in Software Engineering - (Erasmus Mundus Scholarship)** EQF level 7  
Technical University of Kaiserslautern (Germany)  
[www.uni-kl.de](http://www.uni-kl.de)  
Been awarded the prestigious **Erasmus Mundus Scholarship from the EU** for European Masters in Software Engineering (EMSE) Program.  
<http://em-se.eu/>  
1st Major: Software Engineering  
2nd Major: Intelligent Systems
- 09/2014–06/2018 **Bachelor of Engineering in Software Engineering** EQF level 6  
National University of Sciences and Technology, Islamabad (Pakistan)  
<http://seecs.nust.edu.pk/>  
CGPA: 3.75 (German Grade: 1.2)

## WORK EXPERIENCE

- 07/2019–Present **Graduate Research Assistant**  
German Center for Artificial Intelligence (DFKI), Kaiserslautern (Germany)  
<http://www.dfki.de>  
Working as a Research Assistant in the Augmented Vision department in the Computer Vision domain, with focus on **3D Human Pose Estimation and Tracking**, under the guidance of **Prof. Dr. Didier Stricker**.
- 06/2018–09/2018 **Jr. Data Scientist**  
Medical Transcription and Billing Corporation (MTBC)  
<http://www.mtbc.com>  
As part of their Computer Vision team, worked on their core research and development project '**end-to-end Superbills Recognition and Automation**' using Deep Learning algorithms, which falls in the 'Document Analysis and Understanding domain' and OCR. Also developed the Software Architecture and Testing Plan to successfully deploy the system in their working environment.  
MTBC is a US Based Healthcare IT Company (NASDAQ Registered), with head office in NJ, USA.  
**Business or sector** Healthcare IT & Medical Billing
- 03/2017–06/2018 **Research Assistant (Computer Vision + Deep Learning)**  
Dr. Faisal Shafait, TUKL Research & Development Center, Islamabad (Pakistan)

Worked as a research assistant on a number of Machine Learning as well as Deep Learning applications research projects funded by various international companies. The TUKL R&D Center is made in collaboration with the German institute TUKL. Mostly worked on application of Deep Learning for both **printed and handwritten postal address recognition on camera images**. Also developing an end to end pipeline for automated system for postal companies including **address detection, recognition, parsing, classification, form-submission and GPS location visualization**.

#### 15/12/2017–02/2018 **Research Intern (Computer Vision + Deep Learning)**

Dr. Muhammad Moazam Fraz - SEECS, NUST, Islamabad (Pakistan)

**Blood Vessel segmentation in retinal images** is a challenge for image processing algorithms as a lot of medical artifacts as well as pathologies exist with them. The project aims at tackling this problem with applying Convolutional Neural Networks for blood vessel segmentation and classification as well as LSTM network for and semantic analysis of the retinal image, classifying optical disk, retina and different kind of pathologies. Worked on the semantic analysis and classification module.

#### 03/2017–01/2018 **Developer**

DCube Technologies, Islamabad (Pakistan)

<http://dcube.tech>

Worked as a main developer as well as research intern for a project in collaboration with Pitney Bowes (a US based company) on their Android Application for OCR.

<https://www.pitneybowes.com/>

#### 09/2016–02/2017 **Teaching Assistant**

Dr. Asad Anwar Butt, Islamabad (Pakistan)

Worked as a teaching assistant for the course **Data Structures & Algorithms** in which I helped in devising as well as marking a number of quizzes and assignments. Also advised and mentored for a number of semester projects of the course.

#### 06/2016–09/2016 **Research Intern (Network Security)**

SEECS Network Operations, National University of Sciences & Technology (NUST), Islamabad (Pakistan)

Penetration Testing in Wireless Networks. Learned and understood different tools in Kali linux. Applied them on a dedicated access points for finding loop-holes in the SEECS Wireless Network by penetrating it. Proposed algorithms/techniques to cover/fix the found loop-holes.

### PERSONAL SKILLS

Mother tongue(s) Urdu

Foreign language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C1	C1	C1	C1
IELTS					
Arabic	B1	B2	A2	A2	A2
Punjabi	B2	B2	B2	B2	B1
German	B1	B1	A2	A2	A2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user  
Common European Framework of Reference for Languages

Communication skills Excellent communication skills gained from years of experience of public speaking on various

platforms as well as holding leadership positions. Also presentation skills polished from presenting research work in a number of local conferences.

#### Organisational / managerial skills

- **Leadership Skills** - Gained from a vast experience of always being in a leadership position at various levels throughout my academic career.
- **Organizational and Team leading Skills** - Gained as Batch President of my batch in Freshmen year and also from leading the HR position in a college society. Have also been an internship supervisor of a team of 5 students in my research lab.

#### Job-related skills

- Good command in developing solution pipelines of Computer Vision, Machine Learning and Software engineering related problems.
- Expertise in Software Development processes especially software design patterns which are essential in modern and sustainable development.
- Mentoring skills - as an internship supervisor of a team of 5 students in my research lab.
- Research Methodology - Gained from working in the academia throughout my bachelors degree.
- Computer Network Admin - Gained from managing a high end server network in my research lab for 1 year.
- Computer/Network security - Acquired by my certification of Offensive Security coursework for network penetration testing.

#### Digital skills

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem-solving
Proficient user	Proficient user	Proficient user	Proficient user	Proficient user

#### Digital skills - Self-assessment grid

Microsoft Certified Professional Android Verified Developer Penetration Testing - Offensive Security ACM Digital Member
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TensorFlow · PyTorch · Keras · OpenCV · OpenGL · NumPy  
Xcode · Eclipse · MATLAB · Rational Rose · UML Modeling · Verilog  
Kali Linux Tools · C, C++ · C# · Swift · Java · Python · HTML · CSS  
SQL · JavaScript · PHP · Android Development · Android Studio

#### ADDITIONAL INFORMATION

##### Publications

##### **A Comprehensive Deep Architecture for Unconstrained Urdu Handwriting Recognition**

Noor Ul Sehr Zia\*, Muhammad Ferjad Naeem\*, Syed Muhammad Kumail Raza\*, Adnan-Ul-Hasan, Faisal Shafait

\* Authors Contributed Equally

submitted in **Neural Computing and Applications** (IF: 4.213)

on Feb-2019.

**Keywords:** Deep Learning · Computer Vision · OCR · NLP · Urdu · Nastaleeq · CNN · RNN · LSTM · Handwriting Recognition

The paper presents a new unconstrained Urdu Handwriting dataset called NUST-UHWR and proposes an end to end handwriting recognition system based on a new CNN - RNN architecture with n-gram language modelling. In the performed experiments we achieved a minimum character error rate of 5.28 % on Urdu.

## Projects

**Project DART: Deep Address Recognition Technology****Bachelors Degree: Senior Year Project**

- Won **1st Prize** as **BEST ADJUDGED INDUSTRY PROJECT** at SEECS Open House 2018.
- Nominated for **Rector's Gold Medal** for Best Final Year Project of SEECS, NUST.

I developed a deep learning based end to end system for address recognition that provides postal services a cost effective and automated system for postal address recognition, both printed and handwritten. The solution pipeline consist of address localization, recognition, extraction, parsing and dictionary correction. Online Model learning is used to establish a self improving robust system.

<https://github.com/skumailraza/DART>

**MiniJava Compiler** with Optimization Techniques

Implemented for the masters course: *Compilers and Language Processing Tools* at Technical University Kaiserslautern.

<https://github.com/skumailraza/miniJava>

**A simple SAT Solver**

implemented in Python, based on LALR-1 type grammer.

<https://github.com/skumailraza/satsolver>

## Certifications

- Best Industry Adjudged Project, SEECS Open House 2018.
- Selected in Top 12 all over Pakistan in NATIONAL PHYSICS TALENT COMPETITION for International Physics Olympiad.
- Ranked 18th in Asia Regional of International Computer Programming Competition by ACM.
- ACM Student Instructor.
- Microsoft Certified Professional.
- Android Verified Developer.
- 1st prize all over Pakistan in EXYLENT Robotics Workshop held at SEECS, NUST.
- Batch President (2014-15) in university.

## Other Courses

**CS231n - CNNs for Visual Recognition**

cs231n.stanford.edu

**Penetration Testing Techniques**

Offensive-security.com

**ACM Workshops on C++/Python**

Instructor & Mentor

**Introduction to Philosophy, God, Consciousness**

MIT Open-courseware

**CS50x – Introduction to Computer Science**

edX.org & Harvard University

**Introduction to Android Development**

Udacity.com

**Ethical Hacking Workshop**

SEECS - NUST

**EXYLENT Robotics Workshop**

SEECS - NUST

## Memberships

- Teaching - Have served as ACM Student Instructor in teaching programming languages.
- ACM Digital Member

- Experienced Hiker - been associated with Training Impact, Pak.
- Singing & Composing.
- Car Enthusiast.
- Aviation Enthusiast.
- Cyber Security Enthusiast.