



Muhammad Usman Khan

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WORK EXPERIENCE

Tutor

University of Bologna [20/09/2021 – 30/09/2022]

City: Cesena

Country: Italy

Tutor for the master's degree course "Elettronica dei Sistemi Digitali". Assisted students with the lab activities. (30 hours)

Researcher

National Inter-University Consortium for Telecommunications (CNIT) [08/11/2021 – 31/12/2021]

City: Cesena

Country: Italy

Investigated deep learning approaches for multi-user detection in massive machine-type wireless communication and grant-free access scenarios. Contributed towards the report on research outputs and responsible for taking meeting minutes.

Instructor

National University of Computer and Emerging Sciences [28/08/2016 – 29/10/2020]

City: Lahore

Country: Pakistan

I was working as a full-time faculty member at the School of Computing at the National University of Computer and Emerging Sciences, Lahore, Pakistan.

January 2020 – October 2020 I taught the following modules to undergraduate students:

- Digital Logic Design Laboratory (225 hours)
- Computer Organization and Assembly Language Laboratory (135 hours)
- Programming Fundamentals Laboratory (90 hours)

January 2019 – December 2019 I taught the following modules to undergraduate students:

- Operating Systems Laboratory (180 hours)
- Digital Logic Design Laboratory (135 hours)
- Programming Fundamentals Laboratory (135 hours)
- Character and Pattern Recognition Course (45 hours)

August 2016 – July 2017 I taught the following modules to undergraduate students:

- Computer Organization and Assembly Language Laboratory (180 hours)
- Digital Logic Design Laboratory (180 hours)

During this period, I also worked as a teaching assistant to help professors with the evaluation of assignments and quizzes for the course Computer Organization and Assembly Language (90 hours).

I was part of the Lab Instructor Coordination Committee and the National Computing Education Accreditation Council (NCEAC) committee. Improved lab scripts which greatly increased the students' learning outcomes. This boosted my confidence and improved my presentation skills.

Student Ambassador

University of Kent [31/01/2018 – 15/09/2018]

City: Canterbury

Country: United Kingdom

My role on the Unibuddy Scheme was to share my experience at the University of Kent with prospective students through blogs and chats. This role used my good communication skills.

Mentor

University of Kent [15/09/2017 – 15/09/2018]

City: Canterbury

Country: United Kingdom

Mentored Undergraduate Engineering students and undertook a course on mentoring. This has enabled me to develop qualities such as leadership skills and understanding different perspectives.

Course Representative

University of Kent [15/09/2017 – 15/09/2018]

City: Canterbury

Country: United Kingdom

Communicated all academic-related problems to the Student Support Manager, University of Kent. Contributed towards changes in the lab manual scripts to make them more understandable, requiring a great amount of communication and public speaking skills.

Research Assistant

ConSenSys [31/05/2016 – 29/07/2017]

City: Lahore

Country: Pakistan

Worked closely with the research group and achieved two research publications in reputed Journals. Gained teamwork and managing the load.

EDUCATION AND TRAINING

PhD Electronics and Communication Engineering

University of Bologna [31/10/2020 – Current]

Address: via dell'Università, 50, 47521 Cesena (Italy)

Website: <https://www.unibo.it/>

Field(s) of study: Information and Communication Technologies

Level in EQF: EQF level 8

Enrolled in third year of PhD. Working on user detection and channel estimation using deep learning for massive Internet of Things (mIoT) in 6G systems.

Courses

- Communication Systems: Theory and Measurements
- Terza Missione
- Introduction to Quantum Information
- Introduction to Semiconductors
- MIMO Wireless Systems
- Smart Beamforming Strategies
- Massive Multiple Access for 6G

PhD Summer Schools

- Defining 6G: Theory, Applications, and Enabling Technologies, Linköping, Sweden.
- Machine Learning, Energy Efficient Electronics Science and ICT Applications, Brixen, Italy.

MSc Advanced Electronic Systems Engineering

University of Kent [15/09/2017 – 22/11/2018]

Address: Giles Ln, CT2 7NZ Canterbury (United Kingdom)

Website: <https://www.kent.ac.uk/>

Field(s) of study: Engineering, manufacturing and construction

Final grade: Distinction - 84.33 % – Level in EQF: EQF level 7

National classification: FHEQ 7 – Type of credits: ECTS – Number of credits: 90

Thesis: Using Deep Learning Cancer Cell Classification

- Distinction - 84.33 %
- Awarded "The Bestway Foundation Scholarship"
- **Best Overall MSc Engineering Project**
- Best Project on the Advanced Electronic Systems Engineering Programme

Term 1

- Image Analysis with Security Application 85%
- Digital Signal Processing 95%
- Reconfigurable Architecture 90%
- Data Networks and the Internet 87%

Term 2

- Embedded RTOS 97%
- Advanced Pattern Recognition 84%
- Research Methods and Project Design 75%

MSc Project 81%

Individual Projects

1. Using Deep Learning Cancer Cell Classification (MSc Project)

Classification of the cancer cells, mainly found in ovaries, through the digital images of the cells under a microscope using a deep learning approach.

2. Video Graphics Array Controller

Design and Implementation on FPGA of a Video Graphics Array (VGA) Controller through **VHDL** model. I achieved 100% marks.

3. SAYEH Processor

Design and Implementation on FPGA of the SAYEH Processor through model based on VHDL. Beside the 100% marking, I was the only person who was able to complete the project.

Group Project

1. EEG Electrodes with Machine Learning Approach

Machine learning was adopted to reduce the number of electrodes needed for BCI applications using EEG. I proposed a CNN based architecture to reduce the number of electrodes.

B.S. Electrical Engineering

National University of Computer and Emerging Sciences [12/08/2012 – 29/06/2016]

Address: 852-B Milaad St, Block B Faisal Town, 54000 Lahore (Pakistan)

Website: <http://nu.edu.pk/>

Field(s) of study: Engineering, manufacturing and construction

Final grade: Cum-Laude - CGPA: 3.71/4.00 – Level in EQF: EQF level 6

Type of credits: Credits – Number of credits: 139

Thesis: Distributed Monitoring and Control of Building Utilities

Cum-Laude - CGPA: 3.71/4.00

- 2nd position in Electrical Engineering batch 12 Spring Semester, 2013 and 2015
- 4th position in Electrical Engineering 12 batch
- Dean's List in first six semesters

Group Projects

1. Distributed Monitoring and Control of Building Utilities (Final Year Project)

The design and implementation of a wireless sensor and actuator network for monitoring and control of building utilities. My role was to interface and calibrate the sensors and implements the software. The project won two Engineering Project Exhibition at the National Level.

2. Speed Control of DC Motor with PWM using Microcontroller 8051

Designed and implemented a Feedback Control Project that was capable of running a DC motor on the speed entered by the user. My role was to implement the software.

Individual Projects

1. Comparison between TCP and UDP using ns-3
2. Telephone Directory, Fish Aquarium and Checkers game using C++

LANGUAGE SKILLS

Mother tongue(s): **Urdu**

Other language(s):

English

LISTENING C1 READING C2 WRITING B2

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

PUBLICATIONS

[M. U. Khan, E. Paolini, and M. Chiani, "Enumeration and identification of active users for grant-free NOMA using deep neural networks," IEEE Access, 2022.](#)

[2022]

[E. Paolini, L. Valentini, M. U. Khan, F. Babich, M. Comisso, and V. Tralli, 6G Wireless Systems: Enabling Technologies, ser. CNIT Technical Reports. Texmat, Roma, Italy, 2022, vol. 09, ch. Massive Multiple Access for 6G, pp. 137–158.](#)

[2022]

[D. Mzurikwao, M. U. Khan, O. W. Samuel, J. Cinatl, M. Wass, M. Michaelis, G. Marcelli, and C. S. Ang, "Towards image-based cancer cell lines authentication using deep neural networks," Scientific reports, vol. 10, no. 1, pp. 1–15, 2020.](#)

[2020]

[O. S. Bhatti, F. Abbas, M. U. Khan, M. A. Imtiaz, and S. Khalid, "Adaptive collaborative position control of a tendon-driven robotic finger," J. Control Eng. and Appl. Informat., vol. 20, no. 2, pp. 87–99, 2018.](#)

[2018]

ORGANISATIONAL SKILLS

Coordination

Part of the Lab Instructor Coordination Committee which is responsible for Lab Instructors' recruitment, training, and management. Gained organisational skills

PRESENTATIONS IN INTERNATIONAL SCIENTIFIC EVENTS

Poster Presentation

Presented poster titled "Deep Neural Networks for Detection of Active Users in NOMA" at PhD Summer School on "Defining 6G: Theory, Applications, and Enabling Technologies" in Linköping, Sweden.

