

# Muhammad Zubair

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**Date of birth:** 04/02/1993 | **Nationality:** Pakistani | **Gender:** Male | (+92) 3063084534 |

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House No. 13, Street No. 1, 44100, Islamabad, Pakistan

## ● EDUCATION AND TRAINING

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02/01/2012 – 21/04/2016 – Jamshoro, Pakistan

**BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING** – Mehran University of Engineering and Technology

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**CGPA:** 3.65 / 4.00

**Project Title:** Power Quality and Harmonic Analysis of Energy Efficient Lamps

**Short Description:** The project aims at analyzing different lamps on the basis of power quality and harmonic analysis by using a power quality analyzer. The purpose of the project is to suggest lamps suitable for both domestic consumers and the power quality of the system.

**Supervisor:** Noor Nabi (Assistant Professor, Mehran University of Engineering and Technology)

10/09/2017 – 23/09/2019 – Islamabad, Pakistan

**MASTER OF SCIENCE IN ELECTRICAL ENGINEERING (CONTROL SYSTEMS)** – National University of Science and Technology

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**CGPA:** 3.30 / 4.00

**Thesis Title:** Nonlinear Controller Design for the Chemotherapy Treatment of Brain Tumor

**Short Description:** The project aims at designing a controller for the chemotherapy treatment of a brain tumor. The model contains tumor cells, healthy cells, immune cells, and the amount of drug as states and the chemotherapeutic agent as a single input. Nonlinear control algorithms sliding mode control, backstepping based control, synergetic control, and Lyapunov redesign are used to obtain control law for stability analysis and drug dosage for the system. Simulations have been performed in Matlab/Simulink and the results show that chemotherapy is effective enough to reduce the tumor cells.

**Supervisor:** Dr. Iftikhar Ahmad Rana (Assistant Professor, National University of Science and Technology)

## ● WORK EXPERIENCE

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01/10/2018 – 30/09/2019

**RESEARCH SCHOLAR** – SCHOOL OF ELECTRICAL ENGINEERING & COMPUTER SCIENCE, NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY

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Responsibilities:

Experience of working on projects that include designing of the nonlinear controllers for the bio-medical systems which include brain tumor and leukemia models. In lab, performed research related activities, wrote four papers in a time span of one year: two among them accepted for publication in the top journals of the field. Worked under highly qualified professors and with active research groups. Also, attended conferences and symposiums on relevant research areas in the domain of control systems, mathematical modelling of biomedical systems and control of power electronics.

Islamabad, Pakistan

## ● LANGUAGE SKILLS

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**Other language(s):**

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
<b>ENGLISH</b>	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

## ● PUBLICATIONS

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### Publications

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- **Muhammad Zubair**, Iftikhar Ahmad and Y Islam "Back-stepping and Synergetic based Nonlinear Controllers for the Chemotherapy Treatment of Brain Tumor" International Journal of Control, Automation, and Systems, I.F. 2. 733 (Published)
- **Muhammad Zubair**, Iftikhar Ahmad, Y Islam and S Abbas "Variable Structure Control for the Chemotherapy Treatment of Brain Tumor" IEEE Access, I.F. 4.098 (Published)
- **Muhammad Zubair**, Iftikhar Ahmad, Y Islam and A Islam "Lyapunov based nonlinear controllers for the chemotherapy of brain tumor" I.F. 3.341 (Published)
- Yasir Islam, Iftikhar Ahmad, **Muhammad Zubair** and Khurram Shahzad "Double Integral Sliding Mode Control of Leukemia Therapy" Biomedical Signal Processing and Control, I.F. 3.341 (Published)
- Yasir Islam, Iftikhar Ahmad, Asad Islam, **Muhammad Zubair** "Adaptive Terminal Sliding Mode Control of Acute Leukemia Therapy" Biomedical Signal Processing and Control, I.F. 3.341 (Under review)

## ● PROJECTS

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### Projects

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#### 1. Design of nonlinear controllers for brain tumor treatment:

The project aims at designing the controller for the chemotherapy treatment of a brain tumor model. The model contains tumor cells, healthy cells, immune cells, and the amount of drug as states and chemotherapeutic agents as a single input. Nonlinear control algorithms sliding mode control, backstepping based control and Lyapunov theory is used to obtain control law for stability analysis and drug dosage for the system.

#### 2. Design of nonlinear controller of the chemotherapeutic drug for leukemia therapy:

This project includes the controller design of chemotherapeutic drug for leukemia therapy. We take it as a tracking problem and then designed a controller using nonlinear control theory.

#### 3. Design of nonlinear controllers for magnetic levitation system:

The aim of the project is to design a nonlinear controller which will produce the magnetic field of certain strength that is used to regulate the distance between the nominal position of the ball and its center, keeping in mind that the movement of the ball within the magnetic field should be zero.

## ● JOB-RELATED SKILLS

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### Job-related skills

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Programming: MATLAB, Simulink, C++, Fuzzy Toolbox. Software & Tools: Overleaf, MS office, Latex

## ● HONORS AND AWARDS

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### Honors and Awards

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Selected in Erasmus Mundus Exchange Program  
Won merit scholarship during Bachelor of Science  
Got second position in IEEE national quiz competition  
Won USAID merit scholarship 760\$/semester for 2 years in MS  
Captained high school cricket team  
Co-Founder of a startup called RAAR  
RAAR clinched 2nd spot in Hult Prize NUST 2018 (out of 183 teams)  
Received Letter of Appreciation from School of Electrical Engineering

## ● RECOMMENDATIONS

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**1. Name:** Dr Iftikhar Ahmad Rana

**Position:** Assistant Professor

**Organization:** School of Electrical Engineering and Computer Science, National University of Science and Technology

**Email:** Iftikhar.rana@seecs.edu.pk

**2. Name:** Dr Zubair Rehman

**Position:** Assistant Professor

**Organization:** School of Electrical Engineering and Computer Science, National University of Science and Technology

**Email:** zubair.rehman@seecs.edu.pk