

# Fawad Ahmad

## OBJECTIVE

To prove my excellence as a researcher in a dynamic environment where innovation, education, and commitment to achieve preset organizational goals are highly valued and encouraged. I dreamed to be a renowned professional by sharpening my problem-solving skills, enhancing expertise in my areas of concentration, and widening my intellectual.

## EDUCATION

### Doctorate in Emerging Digital Technologies

Period	October 2022 – Ongoing
Principle Subjects	Photonics and Radar Technology
Institute	Scuola Superiore Sant'Anna Pisa, Italy

### Masters in Electrical Engineering (Wireless Communication)

Period	September 2019 – December 2021
Principle Subjects	Advance Analog and Digital Communication, Advance Digital Signal Processing, Advance Probability Theory, Machine Learning, Deep Learning, Signal Estimation and Detection
Institute	National University of Computer and Emerging Sciences (NUCES), Islamabad-Pakistan

### Bachelor in Electrical Engineering (Electronics)

Period	September 2010 – August 2014
Principle Subjects	Electromagnetics, Solid State Electronics, Analog and Digital Electronics, Power Electronics, Microprocessor and Microelectronics, VLSI Design, FPGA, Signal and Systems, Digital Signal Processing, Power Generation and Distribution, Power Transmission, Antennas, C++, Object Oriented Programming, Digital Communication
Institute	Air University (AU), Islamabad-Pakistan

## RESEARCH INTERESTS

MIMO Radar/SAR signal processing, Microwave Photonics, Millimeter Wave Communication, Massive MIMO Systems, Machine Learning

## RESEARCH PROJECTS

### 1. Distributed Drones Project: Ongoing

**Objective:** Design and Optimization of Coherent and distributed multiband radar system of network of drones

**Contribution:**

- RCS modelling of multi-scatterer ground base and maritime targets
- Trained machine learning model to predict RCS of unknown target with low computational complexity.
- Identify and utilize MIMO Ambiguity Function to assess key performing parameters (KPIs) such as Range, Cross-Range, Peak to maximum sidelobe ratio (PMSR), and peak-to-average sidelobe ratio (PASR).
- Evaluated KPIs based on drone's geometer, height from ground, spacing among them, transmitted waveforms, and number of bands.
- Optimizing drone's position using Particle Swarm Optimization algorithm to improve KPIs.

### 2. 93 GHz Wireless Transmission based on a Fully Packaged mm-Wave Band Optical Clock Generator:

Successful transmission and receiving of complex 16QAM OFDM signal using photonic integrated circuit.

### 3. Performance Enhancement of Millimeter Wave Massive MIMO Systems:

Did master thesis on enhancement of millimeter wave massive MIMO systems by applying machine learning and antenna selection algorithms, reducing processing time, complexity and increasing energy efficiency.

## PUBLICATIONS

- W-band Wireless Transmission based on 98 GHz Silicon Integrated Optical Clock Generation (Published OFC 2024)
- RCS Modelling of Extended Targets Using Supervised Learning (Accepted EuRAD2024)
- Genetic Algorithms for Distributed MIMO Radar Antenna Position Optimization (Accepted FUSION2024)
- 93 GHz Wireless Transmission based on a Fully Packaged mm-Wave Band Optical Clock Generator (Published MWP Conference 2023)
- Performance Enhancement of mmWave MIMO Systems Using Machine Learning (Published IEEE Journal 2022)

## SKILLS

### Soft Skills

Social Skills

Having experience in multicultural environment boosted my social skill.

Communication Skill

By having meeting and presentations in job, enhanced communication skill.

Leadership Skill

I have good leadership skills.

Time Management Skill

Meeting deadline of different projects improved my time management skill.

## Technical Skills

Complex Problem Solving	I have strong mathematical skills gained through working on various research projects during academics
Problem Solving Skill	I have strong problem solving skill gained through working on several software and projects at academic level
Software Tools	MATLAB, Simulink, Lumerical Ansys, AutoCAD, HFSS, Proteus, Keil,
Programming Language	C++, C#, MATLAB, Python