

## **Muhammad Fahim Ul Haque**

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### **Objective**

I wish to seek opportunities for research and self-development. My studies have been full of thought, knowledge and have instilled in me a research oriented approach which encourages me to explore areas that are yet to be fully understood.

### **Education**

**Ph.D. Computer Engineering: Linköping University, Linköping, Sweden.  
(2017)**

**MS Telecommunications Engineering: NED University of Engineering Technology,  
Karachi, Pakistan. (CGPA: 3.88 out of 4.0)  
(2010)**

**BE Telecommunications Engineering: NED University of Engineering Technology,  
Karachi, Pakistan. (1<sup>st</sup>Division)  
(2007)**

### **Work Experience**

**(June 2017 – Till date)**

**Assistant Professor: Electronic Department, NED University of Engineering and  
Technology, Karachi, Pakistan.**

**(May 2007 – May 2017)**

**Lecturer: NED University of Engineering and Technology, Karachi, Pakistan**

### **Project under Progress:**

- Design and implementation of transmitter on FPGA with focus higher carrier frequency and wide bandwidth
- Design and implementation of receiver on FPGA.

### **Projects Completed**

- Design and implementation of novel NPWM transmitter on FPGA.
- Design and implementation of novel **aliasing compensated polar PWM transmitter.**

- Design and implementation of novel **combined outphasing aliasing free polar PWM transmitter**.
- Design and implementation of **modified band-limited polar PWM transmitter**.
- Design and implementation of **all digital polar PWM transmitter** (Complete transmitter except Class D power amplifier is implemented in FPGA, where Class D power amplifier is implemented in 130 nm standard CMOS)
- Design of novel **combined RF and multiphase polar PWM transmitter**.
- Design of novel **combined RF and multilevel polar PWM transmitter**.
- IC tape-out of **RF-PWM based Class D power amplifier** in 130nm standard CMOS (Output power +30 dBm; Operating frequency 1 GHz)
- IC tape-out of **all digital RF-PWM based Class D power amplifier** in 130nm standard CMOS (Output power +24 dBm; Operating frequency 700 MHz)
- IC tape-out of **Class AB power amplifier** in 130nm standard CMOS (Output power +23 dBm; Operating frequency 1 GHz)
- IC tape-out of **Delay lock loop based frequency multiplier** in 350nm standard CMOS. (Operating frequency 900 MHz)
- Centralized adaptive antenna tilting system for real time RF optimization of GSM network.
- **802.11a physical layer synthesis on FPGA** (Altera Cyclone IV) using Simulink.
- High level simulation of **Impulse Radio UWB system**.
- High level simulation of **MTI and Pulse Doppler**.

## Relevant Courses

• Wireless Communication	• RF IC design
• Digital Communication	• Transceiver Design
• Information Theory	• Digital system Design
• Communication System	• Analog IC Design & Measurement
• Computer Networking	• Digital Signal Processing

## Technical Skills.

- Digital IC physical design (Work on TSMC 12nm and GF 22nm SOI)
- Analog and RF IC design on Cadence Analogue and RF IC design suite.
- RF IC Design (Work on 65nm standard CMOS, 90 nm standard CMOS, 130 nm standard CMOS and 350 nm standard CMOS).
- High level simulation of communication system. (MATLAB, ADS Ptolemy)
- Low level simulation of complete transmitter. (Co-simulation of ADS, Cadence, Verilog & MATLAB)
- RF PCB Design. (ADS)
- RF system testing and measurement
- Digital design synthesis on FGPA.
- Image and video processing/compression. (MATLAB)

## Professional Training

- Certified Training on ‘HUAWEI BSS’ from Huawei UET Telecom and IT Center, Lahore, Pakistan.

- Certified Training on ‘HUAWEI MSC & VLR’ from Huawei UET Telecom and IT Center, Lahore, Pakistan.
- Certified Training on ‘HUAWEI HLR’ from Huawei UET Telecom and IT Center, Lahore, Pakistan.
- Training on “R&S ZNB Vector Network Analyzer”, NEDUET, Karachi.

## Technical Tools.

Tools/ Skills	Skill Level
• MATLAB (Programing and Simulink)	Advanced
• Keysight ADS (RF design simulator, layout tool & Ptolemy )	Advanced
• Synopsis Fusion Compiler (Floor planning, Synthesis, Clock Tree Synthesis, Routing, ECOs, Flow setup)	Advanced
• Static Timing Analysis on Prim time	Advanced
• Cadence Design Environment for schematic & layout design	Advanced
• ICV, ICVWB, and Calibre for DRC and LVS	Advanced
• Verilog , System Verilog, and VHDL	Advanced
• Python (Particularly for system simulation of Transmitter and Reciver)	Advanced
• Multisim	Advanced
• LaTeX	Advanced
• Microsoft Office (Word, Excel and Visio)	Advanced
• C and C++	Intermediate
• Verilog-A	Intermediate
• Asterisk (VOIP)	Intermediate
• Linux	Intermediate

## About Me

For the past 12 years I am working on the design, implementation and testing of wireless transmitters. My work focused on the design of power efficient and large dynamic range digital transmitters. The performance of the designed transmitters is verified by using custom design ASICs, FPGA and discrete components. In addition have experience in RTL coding and Physical design of digital ICs on advanced nodes.

I am an honest, friendly, open minded person and can easily align myself to the working environment. I am a good team member as well as a confident individual professional.

My private interests include reading, meditation, watching TV and spending time with my family and friends.

## Reports and Publications

- **PhD Thesis:** Pulse-Width Modulated RF Transmitters
- **MS Thesis:** Video Motion Estimation and Compensation.
- "Exploring compiler optimization space for control flow obfuscation." Computers & Security 139 (2024)
- “Approximate Computing: Hardware and Software Techniques, Tools and Their Applications. Journal of Circuits”, Systems and Computers, 2023.

- “Power-efficient aliasing-free PWM transmitter”, IET Circuits, Devices & Systems Volume 13, Issue 3, May 2019.
- “A comparison of Polar and Quadrature RF-PWM”, IEEE NORCAS, Oct. 30-31, 2018.
- “An All-digital PWM Transmitter with Enhanced Phase Resolution”, IEEE Transaction on Circuits and Systems II, Volume 65, Issue 11, Nov. 2018.
- “A modified All digital PWM Transmitter”, IEEE Transaction on Circuits and System I, Volume 65, Issue 2, Feb 2018.
- “Aliasing-Compensated Polar PWM Transmitter”, IEEE Transaction on Circuits and Systems II, Volume 64, Issue 8, Aug 2017.
- “Large dynamic range PWM transmitter”, GigaHertz Symposium, Sweden, March 15-16, 2016.
- “Combined RF and Multiphase PWM Transmitter”, European Conference on Circuit Theory and Design, Norway, Aug 24-26, 2015.
- “Modified Band-Limited Pulse-Width Modulated Polar Transmitter”, International Symposium on Microwave and Optical Technology, Germany, June 29 – July 1, 2015.
- “Power Efficient Band-limited Pulse-Width Modulated Transmitter”, Swedish System on Chip Conference, May 4-5, 2015.
- “Modified polar PWM transmitter”, Swedish System on Chip Conference, 2014.
- “Combined RF and Multilevel PWM Switch Mode Power Amplifier”, NORCHIP, Nov. 11-12, 2013.
- "Efficient and Accurate Object Tracking Combining TSS and 2DLog Search Technique with SIFT", International Conference on Image Processing, Computer Vision, and Pattern Recognition, USA, July 18-20, 2011.
- "Adaptive Algorithm For Fast And Accurate Video Object Tracking Using SIFT And BMA For Slow And Rapid Movements", International Conference on Computer Applications and Network Security, Maldives, May 27-29, 2011.
- “Accurate and Fast Video Object Tracking Technique Using SIFT and 2D Log Search”, International Conference on Machine Learning and Computing, Singapore, Feb 26-28, 2011.

## Languages

- English (Fluent in oral and written communications)
- Urdu (Native)
- Swedish (Basic)

## References

- Available upon request.