

Najath Akram

<https://linkedin.com/in/najath> | <https://www.najathakram.info>
akram.m.n@ieee.org | (330) 990 8406

EDUCATION

PHD IN ELECTRICAL & COMPUTER ENG.

FLORIDA INTERNATIONAL UNIVERSITY

Grad. Dec 2020 | Cum. GPA: 4.0

- Transferred from University of Akron in Aug 2018 due to the relocation of the research group.

BS (HONS) IN ELECTRICAL & INFORMATION ENG.

UNIVERSITY OF RUHUNA

Grad. Jan 2016 | Galle, Sri Lanka

- Nominations for the student of the year (among a batch of 200 students).

ADVANCED DIPLOMA IN BUSINESS MANAGEMENT

NATIONAL INSTITUTE OF BUSINESS MANAGEMENT

Grad. May 2015 | Galle, Sri Lanka

- This is equivalent to associates degree in business management.

SKILLS

WIRELESS SYSTEMS

Expert

- MATLAB, Simulink and Xilinx libraries
- Xilinx FPGA • Filter Design
- PIM Cancellation • OFDM • OTFS
- Advanced Digital Signal Processing
- Wireless Systems Design
- 3GPP Standards for RRU
- Bit-exact Modeling
- Crest-Factor Reduction

Intermediate

- VLSI Design • Vivado
- VHDL • Verilog • System Verilog
- AWR Design Environment

SOFT SKILLS

- Strategic Direction • Public Speaking
- Leadership • Teaching • Coaching
- Marketing • Organizing

EXPERIENCE

PRINCIPAL DESIGN ENGINEER (WIRELESS SYSTEMS) | JABIL INC.

December 2020 – Present | Warren, NJ

- Sr. FPGA Engineer from Dec.2020-Oct.2021.
- Lead Design Engineer from Oct.2021-Sept.2023.
- Principal Design Engineer from Sept.2023.
- Designed and simulated uplink/downlink/PRACH end-to-end, bit accurate executable DFE models, filters for ORAN remote radio units (RRUs) using MATLAB.
- Developed MATLAB models to solve system level issues in LTE/5G RRU.
- Prepared implementation guidance documents compliant with 3GPP standards.
- Conducted research on various topics related to 5G-NR and beyond, including bandwidth parts, orthogonal time frequency multiplexing (OTFS), crest factor reduction (CFR), ORAN functional split, massive MIMO, and passive inter-modulation (PIM).
- Used Keysight VXTs, oscilloscopes, spectrum analyzers and other RF equipment.

GRADUATE RESEARCH ASSISTANT | FLORIDA INTERNATIONAL UNIV.

August 2018 – December 2020 | Miami, FL

- Implemented a digital beamforming array receiver with 800 MHz bandwidth per channel at 28 GHz with FDM based approach to reduce ADC consumption by 75%. Digital designs were implemented on RFSoc ZCU1285 with Xilinx SSR blockset.
- Proposed a method to reduce ADC requirement by 50% for 2D, phased antenna arrays by exploiting multidimensional (MD) signal processing RF systems.
- Used MATLAB and Simulink to implement signal processing algorithms on FPGA.

INTERN | MATHWORKS

September 2019 – December 2019 | Natick, MA

- Worked towards the enhancements of 'HDL Verifier' by MathWorks.
- Gained industry experience in Xilinx Vivado to develop ethernet (PHY interface) IP designs and verified on multiple FPGAs (Artix/Kintex/Virtex).

GRADUATE RESEARCH ASSISTANT | THE UNIVERSITY OF AKRON

August 2016 – July 2018 | Akron, OH

Worked on multiple research projects funded by DARPA and NSF on implementation of advanced digital signal processing systems for MD computational RF systems and gained product knowledge on RF components.

- Low (75% less) complexity 1024-point DFT computational approximator on FPGA.
- Multiplier-less 64-point DFT computational approximator on digital hardware.
- Improving ADC figures-of-merit using Sigma-Delta ($\Sigma\Delta$) noise shaping for MD wide-band antenna arrays & Focal Plane Array Dish Receivers; funded by NSF.

PRODUCT VERIFICATION INTERN | SYNOPSYS INC.

January 2015 – April 2015 | Colombo, Sri Lanka

- Used Spyglass, VHDL, System Verilog, ASIC Flow, Xilinx FPGA.
- Developed test cases to verify the changes done to Spyglass software.
- Developed PERL scripts to automate the product verification process.

PROFESSIONAL EXPERIENCE

EXTERNAL INSTRUCTOR (REMOTE) | UNIVERSITY OF RUHUNA

December 2017 – December 2023 | Galle, Sri Lanka

- Conducted wireless communication, MATLAB/Simulink annual workshops for final year undergraduate students in Sri Lanka.
- Co-supervised research projects on orbital angular momentum for RF systems and NB-IoT processing chain for DFE.

AWARDS AND COMPETITIONS

Winner with two awards in MathWorks intern hackathon fall 2019: iFlash is a secured flash drive using MATLAB to program arduino. Our team won the first place in this competition, and also the award for the most innovative use of MathWorks products. (Massachusetts, USA) ([click here for more info](#))

First Runners Up in Institute of Engineering and Technology (IET) Global Challenge 2015: Among teams consisted of members from 150 countries for the innovative design of intelligent laptop cooler (iCooler) to solve the challenges faced by humanitarian workers. (London, UK) ([click here for more info](#))

Placed in top ten in IET Global Challenge 2017: Among teams consisted of members from 150 countries for the innovative design of vehicle load detector. (London, UK)

Winner in International Photo Contest 2019, organized by Florida International University: Awarded for influence, creativity, artistic ability and appreciation of other cultures. (Florida, USA)

Winner in MangoHack (hackathon) 2019: Among over 40 teams for the innovative design of a secured flash drive. (Florida, USA)

First Runners Up in SAITM robotics challenge 2013 (Colombo, Sri Lanka)

SELECTED PUBLICATIONS

- **Digital and Mixed Domain Hardware Reduction Algorithms and Implementations for Massive MIMO**, Florida International University, 2021.- PhD dissertation ([click here to access](#))
- **Frequency-Multiplexed Array Digitization for MIMO Receivers: 4-Antennas/ADC at 28 GHz on Xilinx ZCU-1285 RF SoC** in IEEE Access, 2021: Under Review.
- **Spacetime Frequency-Multiplexed Digital-RF Array Receivers with Reduced ADC Count** in IEEE Transactions on Circuits and Systems II: Express Briefs vol 68, 2021.
- **Massive-MIMO and Digital mm-Wave Arrays on RF-SoCs using FDM for M-Fold Increase in Antennas per ADC/DAC** in IEEE Space Hardware and Radio Conference (SHaRC), USA, 2021.
- **Fast Radix-32 Approximate DFTs for 1024-Beam Digital RF Beamforming** in IEEE Access vol 8, 2020.
- **A Four-Element Digital Array Receiver at 28 GHz Using a Single Frequency-Multiplexed ADC** in IEEE Int. Symp. on Antennas and Propagation and USNC-URSI Radio Science Meeting, USA, 2019.
- **A direct-Conversion digital beamforming array receiver with 800 MHz channel bandwidth at 28 GHz using Xilinx RF SoC** in IEEE International Conference on Microwaves, Antennas, Communications and Electronic Systems (COMCAS), Israel, 2019.
- **Sampling H- & V-Polarized Antennas using a Single ADC for Digital Antenna Arrays by Exploiting Multi-Dimensional Signal Processing RF Circuits** in IEEE 23rd Int. Conf. on Digital Signal Processing, China, 2018.
- **Multiport ADCs for Microwave Focal Plane Array Dish Receivers** in IEEE Int. Symp. on Circuits and Systems, Italy, 2018.
- **Improving ADC Figure-of-Merit in Wideband Antenna Array Receivers using Multidimensional Space-Time Delta-Sigma Multiport Circuits** in IEEE 10th Int. Workshop on Multidimensional (nD) Systems, Poland, 2017.
- **Multi-beam radio frequency (RF) aperture arrays using multiplierless approximate fast fourier transform (FFT)**, Univ. of Akron and Federal Univ. of Pernambuco, Brazil, Tech. Rep. AFRL-RY-WP-TR-2017-0144, 2017, sponsored by Air Force Research Laboratory Sensors Directorate, Wright-Patterson Air Force Base, 2017

LEADERSHIP ROLES AND VOLUNTEER ACTIVITIES

Tau Beta Pi Engineering Honor Society - Central Jersey Alumni Chapter | Treasurer | January 2022 - January 2024

Tau Beta Pi Engineering Honor Society - Florida Theta Chapter | Treasurer | April 2019 - December 2020

- Planning and organizing high-impact student activities to enhance the academic and professional quality of engineering education in Florida.

Ruhuna University - Engineering Gavel Club (Toastmasters) | January 2015 - December 2022

- Founding member and the president (January 2015-January 2016) of this society (over 200 members)
- Patron and the general evaluator for speech projects (January 2016-December 2022)
- Collaborated with Toastmasters International, USA and worked on improving public speaking skills of its members.

The Institution of Engineering and Technology | Student Member | February 2013 - Present

- National Executive Committee Member in Sri Lanka (February 2013 - July 2016)
- Industrial relationship manager at Ruhuna University Chapter (January 2015 - January 2016)
- Event organizer at Ruhuna University Chapter (January 2014 - January 2015)
- IET is the world's largest professional body for engineers and technicians from all disciplines.
- Planned and organized programs to improve the technical education, engagement & quality of young engineers in Sri Lanka. Regularly reviewed the key metrics to make sure chapter goals are achieved. Developed plans to establish rapport with local chapters and used strategy to advocate IET in local universities.

Institute of Electrical and Electronics Engineers (IEEE) | Student Member | February 2013 - Present

- Program committee leader (February 2014 - January 2015) for Ruhuna University Chapter.
- Planned and organized robotics competitions, teaching workshops and electronics design competitions.