

# ALI AQDAS

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## EDUCATION

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**National University of Sciences and Technology, Islamabad** *September 2019 - Present*  
B.E. in Electrical Engineering CGPA: **3.93/4**

Thesis: SoC Implementation of RISC-V Vector Processor

Advisor: Dr. Muhammad Imran

Co-advisor: Dr. Rehan Ahmed

## EXPERIENCE

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**Integrated Circuits Design Lab** January 2023 - June 2023  
*Junior Research Assistant* *Islamabad, Pakistan*

- Integrated a chaining mechanism into previously designed vector processor.
- Implemented parameteric microarchitectural components for easy scalability.
- Performed the physical implementation on 65nm through Genus Synthesis Tool.

**System-on-Chip(SoC) Design Lab** June 2022 - December 2022  
*Hardware Design Intern* *Islamabad, Pakistan*

- Led a team in development of a RISC-V based Vector Processor.
- Integrated Vector Extension with a Scalar Core.
- Developed a Neural Network in RVV Intrinsics.

**AI Lounge** July 2021 - Present  
*Teaching Assistant* *Islamabad, Pakistan*

- Researched TinyML and its applications.
- Implemented a Fall Detection System to reduce fatality risk in elderly people through appropriate alerting system.
- Developed content for Workshop/MOOC in collaboration with Dr. Syed Ali Raza Zaidi (University of Leeds) and Dr. Hassan Aqeel (Aston University).

**Signal Processing and Machine Learning Lab (SIGMA)** July 2020 - October 2020  
*Summer Intern* *Islamabad, Pakistan*

- Designed a tool to localize anomalies in whole slide images to reduce doctors' effort in diagnosing tumors.
- Performed tiling of ultra high resolution images using OpenSlide
- Binary Mask generation for image segmentation using GeoJSON and SciKit Image

## TECHNICAL STRENGTHS

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### Hardware Descriptive Languages Programming Languages

Verilog HDL  
C, C++, Python, MATLAB, Embedded-C,  
RISC-V Assembly

### Deep Learning Frameworks

Tensorflow 2, Tensorflow for Microcontrollers, PyTorch,  
FAST.AI

### Tools

Proteus, PSPICE, Quartus Prime

## PROJECTS

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### FPGA Implementation of Bresenham Circle Drawing Algorithm

Bresenham Circle Drawing algorithm is a lightweight algorithm to draw circles on computer that only computes points for an octant of circle, and uses eight way symmetry to draw a full circle.

- Implemented Bresenham's Circle Drawing Algorithm in Verilog to draw circles with variable radii.
- Utilized University of Toronto's VGA Adapter to display the output on LCD using DE1-SoC.  
[https://www.eecg.utoronto.ca/~jayar/ece241\\_7F/vga/](https://www.eecg.utoronto.ca/~jayar/ece241_7F/vga/)

### Intelligent Traffic Control System

Intelligent Traffic Control System (ITCS) is a traffic light switching system based on Infrared Sensors to reduce traffic congestion at peak hours.

- It uses to infrared sensors count the number of vehicles entering and exiting a road.
- An Arduino is utilized to implement a light switching algorithm for optimized switching.
- Traffic Jam Detection to detect possible emergencies and generate an alarm for concerned authorities.

### Buck Converter Control Design and Simulation

Buck Converter is a Voltage Regulating Device which can downscale DC Voltage. It however requires a control system to keep a stable voltage irrespective of load device. In our project we have designed a buck converter using control techniques such as Root Locus and Bode Plots and used SIMULINK to simulate our design. Our specifications are

- 28V Input with a 4V Ripple
- 1-10A Load Current
- 2% Output Voltage Ripple at 5V

### Further Projects available on LinkedIn