ALI AQDAS

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EDUCATION

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

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

***Project Title**: "SoC Implementation of RISC-V Vector Processor"*

- Developed a chaining mechanism for parallel operation of functional units.
- Implemented parameteric microarchitectural components enabling scalability.
- Worked on physical mapping of microarchitecture on TSMC 65 nm.

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

***Project Title**: "SoC Implementation of RISC-V Vector Processor"*

- Developed and integrated a vector extension with a scalar core.
- Developed a neural network and benchmark kernels using intrinsic instructions.

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

***Project Title**: "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*

***Project Title**: "Keratin Pearl Localization in Whole Slide Images"*

- 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

Hardware Descriptive Langauges	Verilog HDL
Programming Languages	C, C++, Python, MATLAB, Embedded-C, RISC-V Assembly
Deep Learning Frameworks	Tensorflow 2, Tensorflow for Microcontrollers, PyTorch, FAST.AI
Tools	Quartus Prime, Proteus, PSPICE

MANUSCRIPTS UNDER REVIEW

1. A. Aqdas, M. Ibrahim, F. Gul, R. Ahmed, and M. Imran. V-Flow: A RISC-V Vector Processor for Machine Learning.

PROJECTS

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$_0$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