

Masaad Khan

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EDUCATION

The University of Texas at Austin

August 2019 – Present

B.S., Electrical and Computer Engineering, 3.50/4.00 Overall GPA

Relevant Coursework: Computer Architecture, Linear Systems and Signals, Digital Logic Design, Operating Systems

WORK EXPERIENCE

Tenstorrent

Austin, TX

Design Verification Intern – RISC-V CPU Team (Full-time)

January 2022 – May 2022

- Modified and Compiled Google's open-source RISC-V DV toolkit to generate tests in System Verilog; became familiar with UVM
- Migrated Tenstorrent's enhancements to the vector, floating point, and more units to Google's head commit
- Produced testbenches using RISC-V DV and ran them in VCS and whisper (RISC-V ISS) to ensure no system breaking changes
- Generated diagrams in React using Python and data from SQL to describe our RTL interfaces; streamlines testbench generation
- TBD.

Tesla

Palo Alto, CA

Silicon Development Intern – Autopilot Hardware Group (Full-time)

January 2021 – August 2021

- Completed working voltage sensor and SPI drivers despite a complicated bug in Tesla's SPI silicon
 - Implemented and rigorously tested a software architecture designed to funnel temperature and voltage data over SPI
 - Improved a python script to recursively parse generated protobuf, automated sending protobuf messages by filling a .JSON/.proto file, and synced this script as well as the hardware based on messages received over UART
 - Created a python script able to generate QSPI images working around the LittleFS library, which used linux-like commands
 - Gained experience writing firmware running ARM CMSIS RTOS wrapper for FreeRTOS, including drivers, interrupt handlers, etc
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RESEARCH EXPERIENCE

Wireless Networking and Communications Group - UT Austin

Austin, TX

Undergraduate Researcher

August 2021 – Present

- Generated image datasets of Airsim drone simulations in Unreal Engine using C++ and Python; made to help train a CV model
 - Coordinated with another undergraduate student to deliver object-detection using MobilenetV2 on the Jetson Nano
 - Provided a networking stack to detect latency for a center-less cloud of Jetson Nanos using ZeroMQ and Google Protobuf
 - Worked closely with a PhD student under researching In/Out of Distribution inputs to neural networks
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PROJECTS

RGB LED Keyboard with an OLED Screen

December 2019 - Present

- Researched components, and integrating all the parts into a complete working design
- Incorporated RGB LED Matrix with single channel per LED via Pulse Width Modulation (PWM)
- Selected to present the PCB, software, and hardware designs at the ECE Showcase 2020 to UT alumni
- Became familiar with and implemented I2C and SPI protocols for OLED and LEDs respectively
- Integrating keyboard-to-OLED and rotary-encoder-to-OLED interfacing capabilities
- Parts used: Atmega32U4 microcontroller, OLED screen, Shift registers, RGB LEDs, Rotary Encoder, Key switches, USB-C, etc.

Implemented a Cycle-level Pipelined Simulation of a 16-bit CPU

August 2020 – December 2020

- Designed a simulator of the LC3-B microarchitecture and ISA in C
 - Created a two-pass assembler to convert LC3-B Assembly into machine code
 - Built support for interrupts and exceptions, by modifying the data path and state machine
 - Produced Virtual ↔ Physical Address translations to allow allocation for Virtual Memory
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SKILLS

- **Programming Languages:** Verilog, Python, C, Bash, C++, ARM Thumb Assembly, System Verilog
- **Libraries:** ARM CMSIS RTOS, FreeRTOS, Protobuf, Nanopb, Threading (Python), PySerial, PyFTDI, LittleFS (Python), PyTest
- **Computer Science:** Object Oriented Programming, Data Structures, Machine Learning, Operating Systems, Agile
- **Software Applications:** VCS, UVM, Whisper, Vivado, Git, Lauterbach, Linux, MATLAB, KiCad, Autodesk Eagle