


SYED NOORUL SAAD

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EDUCATION

University of Waterloo

Candidate for B.A.Sc Computer Engineering

Waterloo, ON

Sep 2022 - Ongoing

Relevant courses: Reconfigurable Computing (FPGA Architecture), Real Time Operating Systems, Digital Hardware Systems, Computer Architecture, Compilers, Embedded Microprocessor Systems

PROJECTS

Matrix-Vector Engine + Activation Unit *SystemVerilog, AMD/Xilinx Vivado, PYNQ-Z1 FPGA*

- Designed and implemented a pipelined Matrix-Vector Multiplication (MVM) engine in SystemVerilog, inspired by Microsoft Brainwave's deep learning inference accelerator.
- Optimized for throughput and latency using DSP48e1 slices, capable of calculating **27 outputs in parallel at 280 MHz**.
- Built a fully pipelined hyperbolic tangent (tanh) approximation unit based on a Taylor series approximation for nonlinear activation. **Improved performance from 170 MHz to 320 MHz**.

Single Cycle RISC-V Processor *SystemVerilog, Assembly*

Developed a single-cycle RISC-V processor (RV32I), supporting full instruction decoding and execution; verified correctness using custom assembly test cases.

Shell Jr *C++, OpenAI API*

A custom terminal built from scratch in C++, intended for beginners who have little experience with the command line. Includes an AI "explain" command which can explain any CLI functionality.

EXPERIENCE

UW ASIC Design Team

Digital Design Team

Waterloo, ON

August 2025 - Ongoing

- Implemented a **Serial Peripheral Interface (SPI)** module in Verilog, incorporating flip-flop synchronizers to handle **clock domain crossing** and prevent metastability
- Developed and executed verification tests using **Cocotb**, a Python-based testbench framework, as part of the team's **TinyTapeout** ASIC flow

VCast Online

Software Engineer

Dubai, UAE

January 2025 - May 2025

- Led the full-stack development of a collaborative mind-map platform, enabling real-time feedback and map sharing, **driving community engagement up by 25%**.
- Built and deployed a scalable SvelteKit + Node.js web app from scratch, integrating dynamic graph editing (Cytoscape.js), Google OAuth, JWT authentication, and enforced access control logic (owner vs viewer privileges)
- Architected and integrated a Mongoose-based feedback system, enabling structured insights collection on nodes, edges, and the graph as a whole — **improving data access times by 18%**.

Dematic

Technical Writer

Waterloo, ON

May 2024 - August 2024

- Developed comprehensive technical documentation for Dematic's mechanical and control systems, enhancing user understanding and supporting the seamless integration of advanced automation technologies.
- Authored detailed user manuals and technical guides for Dematic's InSights logistics software, ensuring clarity in functionality and facilitating efficient software deployment across multiple industries.
- Simplified complex engineering concepts for diverse audiences, enhancing usability and efficiency.

Matrox Imaging | Zebra Technologies

Technical Writer

Dorval, QC (Remote)

January 2023 - April 2023

- Documented and tested new features added to the company's proprietary software, Matrox Design Assistant, which is a flowchart-based software allowing users to design their own imaging apps.
- Collaborated with software engineers to document new functions and capabilities in the company's C Library (Matrox Imaging Library).

LANGUAGES AND TOOLS

Languages: C/C++, SystemVerilog/VHDL, JavaScript, Python

Tools: Git, Xilinx Vivado, Quartus, GTKWave, VTR, OpenFPGA, Visual Studio Code, JIRA