

# Kevin Patel

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## TECHNICAL SKILLS

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**Languages:** C/C++, SystemVerilog, VHDL, Python, Bash

**Tools:** Git, Vivado, Linux, STM32Cube, Arduino, AutoCAD, Inventor, FrameMaker, JIRA, Confluence, MS Office

## PROJECTS

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### Fixed-Point Tanh Accelerator | *SystemVerilog, Vivado, Fixed-Point Q2.12* 🔒

- Designed a **23-stage pipelined tanh circuit** using an 11th-degree Taylor approximation in Q2.12 format.
- Integrated a ready/valid handshake for stall-safe streaming operation.
- Met timing closure at **180+ MHz** after FPGA synthesis.

### Matrix-Vector Multiplication (MVM) Engine | *SystemVerilog, Vivado, FSM* 🔒

- Built an **8-lane MVM** accelerator inspired by Microsoft BrainWave, with pipelined dot product + accumulation units using **8 DSP blocks per lane**.
- Designed a control FSM to sequence matrix/vector memory reads and coordinate accumulation across lanes.
- Verified correctness with a parameterized testbench, achieving **150+ MHz** throughput on the FPGA.

### LEDify | *ESP32/ESP8266, C++, HTML/CSS, JavaScript* 🔒

- Developed an **ESP32/ESP8266-based** smart LED control system with a web interface for real-time color, brightness, and animations on a **10-meter strip with 600 LEDs**.
- Created a responsive UI with HTML, CSS, and JS, using HTTP requests to handle LED updates over Wi-Fi.
- Optimized LED control with Adafruit NeoPixel for smooth effects and improved responsiveness.

### Biro-1 Media Controller (Ongoing) | *PCB, Firmware, 3D CAD, System Integration* 🔒

- Developing a custom PCB-based media controller with mechanical keys, a rotary haptic dial, and both wireless (Bluetooth) and wired (USB-C) connectivity.
- Designing the **3D-printed chassis and internal layout**; implementing USB firmware for host communication.
- Collaborating with teammates on Bluetooth, battery management, and power delivery for full device functionality.

## EXPERIENCE

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### Software Developer

Jan 2025 - Present

*PINKBYTE*

*Vaughan, ON, CA*

- Built a custom Android kiosk system with a launcher, boot animation, and lockdown features.
- Worked directly with system partitions and flashing tools to deploy builds and debug board-level issues.
- Reduced boot time by **4.4s** and increased memory bandwidth by **37%** on the uSOM 820 via OS optimizations.
- Wrote cleanup scripts to remove bloatware, clear temp files, and limit background activity to reduce memory usage.

### Technical Writer

Sept 2023 - Dec 2023

*NCR VOYIX*

*Waterloo, ON, CA*

- Created user-friendly technical documentation for bi-weekly code drop releases, reaching **500+** developers.
- Monitored the software development process with JIRA & GitHub, reducing turnaround time by **20%**.
- Ensured accuracy and consistency of API documentation, leading to a **15%** decrease in customer support inquiries.
- Utilized development tools such as Docker Desktop, Postman, and VS Code to enhance software development practices and maintain high standards in code management.

## EDUCATION

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### University of Waterloo

Waterloo, ON

*Bachelor of Applied Science in Computer Engineering*

*2022 - 2027 (Expected)*

- Relevant Courses:** Digital Hardware Systems, Embedded Microprocessor Systems, Real-Time Operating Systems, Systems Programming & Concurrency, Digital Computers, Algorithms & Data Structures, Signals & Systems

## AWARDS & ACHIEVEMENTS

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**President's Scholarship of Distinction** — Awarded for admission average of **95%+** (University of Waterloo)

**1st Place, ASA DataFest** — \$2000 prize for Best Insight out of **20** teams (**75+** students internationally)

**Best HealthTech Project** — Hackathon winner out of **100+** participants for *Dr. Discord* bot