Ameya Kumthekar

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TECHNICAL SKILLS

Languages: C/C++, Assembly (ARM, 8051), SystemVerilog, MATLAB, Git, Python, SQL, JavaScript, HTML/CSS
Instrumentation: Oscilloscope, DMM, Function Generator, Thermocouple, Accelerometer, LCR Meter
Other Skills: SolidWorks, KiCad, Quartus, ModelSim, Git, Soldering, Altium, Signal Conditioning

EDUCATION

University of British Columbia — Vancouver, BC
Bachelor of Electrical Engineering - Co-op — ***Relevant Coursework:*** *Systems and Controls (96%)*

PROJECTS

RISC-V Machine | *SystemVerilog, FPGA Programming, Quartus, Modelsim, Git, Digital Logic*
- Designed and implemented a pipe-lined **RISC-V** processor using SystemVerilog on an Intel FPGA with an integrated ARM Cortex host.
- Engineered a **5-stage** pipeline architecture **(IF, ID, EX, MEM, WB)** to optimize execution speed and reduce clock cycle stalls by over **30%.**
- Developed comprehensive **testbenches** in **ModelSim**, achieving **100% pass rate** across **50+** instruction and hazard test cases across all operation stages.
- Synthesized and deployed the processor design using **Intel Quartus Prime** on a **Cyclone V** FPGA, verifying RTL implementation through logic diagram inspection and static timing analysis.

Coin-Collecting Robot | *C, Embedded Systems, UART, PIC32, EFM8, SPI Flash, LCD UI, Digital Design*
- Designed and built a **dual-mode** (manual and automatic) robot capable of detecting, collecting, and storing metallic coins using **inductive sensing** and an **electromagnet arm**, achieving over **90% detection accuracy** and reducing average collection time to under **3 seconds per coin**.
- Integrated **3** microcontrollers **(2 PIC32MX, 1 EFM8)** communicating via UART and SPI to manage joystick control, audio feedback, and touchscreen interface.
- Improved real-time performance by using **PWM-based motor control**, mechanical switching to reduce noise, and voltage regulation across mixed-voltage components, reducing coin-detecting and picking-up time by **200%**.
- Engineered a robust **wireless communication system** using **dual JDY-40 UART** transceivers, with buffer error handling and real-time control between master/slave modules.

ENGINEERING STUDENT DESIGN TEAM

Electrical Engineer — Aug 2024 – Present
SUBC - UBC's Human Powered Submarine — *Vancouver, BC*
- Programmed the **BNO055 sensor** via **I2C** to collect real-time Euler angle and accelerometer data, enabling closed-loop motion adjustments for submarine stability and control.
- Developed firmware for **Nordic Semiconductor (nRF)** boards using UART communication for live data acquisition; served as the primary microcontroller for onboard telemetry.
- Designed and laid out custom PCBs using **Altium Designer** and **KiCad** to interface sensors and microcontrollers, improving signal integrity and reducing wiring complexity.

Drivetrain and Propulsion Engineer — Aug. 2023 – Aug 2024
SUBC - UBC's Human Powered Submarine — *Vancouver, BC*
- Researched, modeled, and prototyped a novel **toroidal propeller** using **SolidWorks CAD & CFD**, improving propulsion efficiency and structural integrity by **150%** compared to the previous year's design
- Designed and simulated a **direct-drive transmission system** in achieving an **8× increase** in mechanical resilience under peak operating loads

Safety Officer - 3rd in Command — Aug 2024 – Present
SUBC - UBC's Human Powered Submarine — *Vancouver, BC*
- Oversaw safety operations for a **50+ member** engineering team, proactively addressing hazards and enforcing compliance across mechanical and electrical subteams
- Authored and updated **Standard Operating Procedures (SOPs)** for tool use, battery handling, and confined space entry; conducted onboarding safety briefings and lab tours