

Sahaj Singh

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SKILLS

Programming Languages: C, C++, Python, MATLAB, Java, Assembly, HTML5/CSS3, Javascript
Tools & Technologies: Git VC, Visual Studio Code, PyCharm, macOS, Linux, Windows

WORK EXPERIENCE

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- MathWorks** Burnaby, BC
MATLAB — SFU Student Ambassador Oct 2022 — Present
- Organizing and hosting numerous programming and simulation based events revolving around MATLAB and Simulink.
 - Helping in the process of creating meaningful relationships between MATLAB and professors/students at SFU. Providing support for students with questions related to MATLAB and Simulink.
- picoTera Electronics Inc.** Richmond, BC
Software/Firmware Developer Jan 2022 — April 2022
- Developed advanced firmware features in C for communication devices operating on PSoC6 embedded platforms. Designed and implemented custom feature sets to enhance device functionality and user experience.
 - Constructed tailored datasets to facilitate the training and optimization of Recurrent Neural Network (RNN) models for effective noise reduction in smart denoising applications.
 - Integrated Bluetooth Low Energy (BLE) between the PSoC6 device (firmware written in C) and an Android application (written in Java), enabling real-time, efficient data transmission and bolstering overall user experience.

PROJECTS

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- Multi-threaded Memory Allocator** *C, Make*
- Developed a multi-threaded memory allocator in C, supporting First Fit, Best Fit, and Worst Fit allocation algorithms.
 - Implemented features such as allocator initialization, allocation/deallocation interfaces, metadata management, compaction support, statistics reporting, multi-threading support, and uninitialization.
 - Designed test cases and provided usage instructions to ensure the proper functionality and efficiency.
- FPGA UART Protocol Implementation** *VHDL, Modelsim, Altera DE2*
- Developed a UART protocol for the Altera DE2 FPGA, featuring baud rate generation, data framing, error detection and correction, and handshaking subsystems.
 - Implemented in VHDL with comprehensive testbenches to verify the functionality of both the transmitter and receiver modules.
 - Enabled synchronous data transmission between UART devices and allowed for seamless operation via onboard switches and keys for data input, baud rate selection, and module reset.
- Drone Controller and System** *Embedded C, Arduino (C++), Beaglebone*
- Designed a wireless drone system using a BeagleBone Green and Arduino Nano 33 IOT drone.
 - Developed multiple control modes, integrated LCD display, and implemented an ultrasonic sensor for gesture-based height control.
 - Wrote a custom driver for efficient BLE communication between the controller and drone.
 - Incorporated a watchdog and systemd script for automated restarts to handle any unexpected system crashes.
- FASTrack - Reaction Time Game** *Assembly, Embedded C, Zedboard*
- Developed a reaction time-based game called FASTrack for the Xilinx ZedBoard, utilizing the ARM7 assembly instruction set.
 - Implemented various game features such as multiple speed modes and user controls through switches. Utilized OLED display and LEDs for visual feedback.
 - Demonstrated key concepts including timer interrupts, masking, OLED display usage, and Finite State Machines (FSMs).

EDUCATION

B.A.Sc. Computer Engineering — Honours Burnaby, BC
Simon Fraser University Sep 2020 — Sep 2025

AWARDS

Innovation Award/ESSS Award: 2022 SFU — Engineering Science Student Society
Honors contributions to the student society and Recognized for outstanding creativity, originality, and impact via my projects driving advancements in technology.