# Sahaj Singh

sahajs.com | sahaj_singh@sfu.ca | Sahaj–Singh | SatireSage

## TECHNICAL SKILLS

**Programming Languages:** **C / C++**, **VHDL**, **Python**, MATLAB, Bash, Java, Assembly, **SQL**, **HTML5/CSS3/JS**, Flutter
**Tech Stack:** **Linux**, **Git**, **Jira**, React, TensorFlow, PyCharm, **VS Code**, **macOS**, Windows, Android
**Linux:** **SSH**, Admin, **Bash/Zsh/Csh**, Kernel Config, Pkg/FS Mgmt, Networking, UFW/iptables, cron
**Relevant Courses:** **Embedded Systems**, Digital Systems Design, **Fundamentals of Digital Logic and Design**

## WORK EXPERIENCE

**CBU Software Engineer** **Jan 2024 — Present**
***Microchip Technology Inc.*** Burnaby, BC

- Developing/supporting test framework for both pre-silicon and post-silicon testing for the **Meta DX2+** and **META-DX** chipset.
- Setup and configuration evaluations boards for **SW verification**.

**ENSC 252 | Fundamentals Of Digital Logic & Design | Teaching Assistant (TA)** **Sep 2023 — Dec 2023**
***Simon Fraser University*** Burnaby, BC

- Assist students in understanding **digital logic and design concepts** during lab sessions, tutorials, and office hours.
- Designed, supervised, and graded **bonus projects** to test students' understanding of the course material. Incorporated Concepts such as **One Hot Encoding, Debouncing Circuits,** and **Finite State Machines Moore**.
- Verified pre-existing lab solutions, documented any issues that arose and added additional components to the lab material.

**Software/Firmware Developer** **Jan — April 2022**
***picoTera Electronics Inc.*** Richmond, BC

- Developed advanced firmware using **Object-Oriented Programming (OOP)** principles in **C/C++** for **PSoC6 and ARM Cortex-M4, M0 platforms** and ported the project from PSoC creator to ModusToolbox 2.4 for better compatibility.
- Implemented modifications to a **TensorFlow based Recurrent Neural Network (RNN) model written in Python** and **ported in C** for Cortex-M4 devices, reducing noise in audio denoising applications approximately from **90+ decibels down to 60 decibels.** Additionally, created a custom audio dataset to train the RNN model, increasing the variety of noise profiles.
- Authored custom **cmake scripts for CMSIS libraries**, reducing memory usage and storage in complex operations and enabled Bluetooth Low Energy **(BLE) integration** between PSoC6 and an Android app, facilitating real-time data transmission.

## PROJECT EXPERIENCE

**FPGA-UART-Protocol:** **Spring 2023**

- Implemented the **UART protocol for the Altera DE2 FPGA**, featuring baud rate generation, data framing, error detection and correction, and handshaking subsystems.
- Designed a full-fledged VHDL implementation, bolstered by **comprehensive testbenches and simulations** to ensure proper functionality across both 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.

**Scrolling Message Display Board (SMDB):** **Fall 2021**

- Developed VHDL code to drive scrolling messages on a HEX display, ensuring fluid motion and clear visibility.
- Designed a **custom Instruction Set Architecture for the ASIP** to meet the board's specific demands.
- Deployed and rigorously tested the entire system via testbenches and on an **Altera DE2-115 board using Quartus** via **custom/edge cases**, confirming stable performance and reliability.

## EDUCATION

**B.A.Sc. Computer Engineering Major – Honours | Computing Science Minor** **Sep 2020 — Present**
***Simon Fraser University*** Burnaby, BC

## LEADERSHIP EXPERIENCE & AWARDS

**MATLAB — SFU Student Ambassador** **Oct 2022 — Present**
***MathWorks*** Burnaby/Surrey, BC

- Organizing and hosting numerous programming and simulation based events revolving around **MATLAB and Simulink.**
- Providing support for students with MATLAB and Simulink. Creating meaningful relationships between **MathWorks and SFU.**
- Collaborate with various Student Societies and Events held across all SFU campuses.

**ESSS Innovation Award | ESSEF Award** **Fall 2021 — 2022**
***Engineering Science Student Society (ESSS) | Simon Fraser University*** Burnaby/Surrey, BC

- Recognized for outstanding creativity and impact via my projects. Honors contributions to the student society.