Shreyas Kakulavarapu

• **Phone:** (778) 833 2536 • **Email:** skakulav@sfu.ca • **LinkedIn:** www.linkedin.com/in/shreyas-kakulavarapu

SKILLS

SOFTWARE

- C++ (OOP, Procedural)
- Python (OOP, Procedural)
- Embedded C (8051, Arduino)
- MATLAB + Simulink
- Adobe Suite + MS Office

MECHANICAL

- SolidWorks (Stress Analysis)
- Autodesk AutoCAD
- Dynamic Mechanical Analyzer (DMA) Operation
- Autodesk Fusion 360

ELECTRONICS

- AC/DC Circuit Design + Simulation (Proteus, SPICE)
- PCB Design (EAGLE, KiCad)
- Oscilloscope + Multimeter
- Soldering (Through-Hole, SMD)

TECHNICAL WORK EXPERIENCE

Fuel Cell Testing Engineering - Lab Assistant **January 2020 - April 2020**

SFU Fuel Cell Research Laboratory (FCReL)

- Developed methodologies for fuel cell testing to observe chemical and electrical effects on fuel cells under load, which included troubleshooting of issues.
- Performed frequency testing with DMA on samples to determine mechanical properties, such as tensile strength, fatigue, and creep.
- Coordinated logistics and delivery for lab supplies between university finance department and suppliers to ensure smooth operation of the lab.

ACADEMIC PROJECTS

COVID-19 Prediction Model in Python – Software Programmer **April 2021**

Simon Fraser University - Machine Learning in Mechatronics

- Used linear regression and support vector machine (SVM) regressor to develop model for COVID vaccination rates for several countries.
- Implemented multiple libraries for data-processing, including Keras, TensorFlow, NumPy, and pandas.
- Estimated completion of full vaccination, down to the day, for 5 different nations.

8051 Range Finder – Embedded System Programmer **December 2020**

Simon Fraser University – Digital Logic and Microcontrollers

- Utilized embedded C code converted to hex on virtual 8051 microcontroller to make range finder, which interfaces with an ultrasonic sensor and display to print distance.
- Conducted simulation and testing entirely through remote means due to COVID restrictions; used available tools and software to finish the final product without physical access to board.

Robotic Arm – Software + Electrical Systems Designer **May 2020 - August 2020**

Simon Fraser University – Mechatronics Design II

- Modelled assembly of robotic arm on SolidWorks in design stage.
- Constructed scale three-axis robot using sustainably sourced materials with two other group members.
- Programmed and debugged software for robot using Arduino IDE. Implemented motor PID control software.
- Demonstrated a successful operation of the robot picking up an item and moving it to a set location.

Drone Mission Reader – Autopilot Team Programmer **June 2019 - March 2020**

Simon Fraser University - Team Guardian

- Created a Python 3 program that can read coordinate data from a .json file, recognize obstacles and waypoints, and formulate multiple mission plans from the data.
- Coordinated with team members to implement the program as part of new drone guidance software.
- Implemented A* search algorithm to execute mission based on data provided.

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PERSONAL PROJECTS

Form Detection System – Formyk Software and Simulation Team Lead **January 2022 - Ongoing**

Simon Fraser University – Capstone Design Technical Project I

- Working with team of seven to create prototype using Arduino and four inertial measurement units (IMUs), to capture motion of the user and determine form issues on deadlifts.
- Developed Python script and simulation model in Blender to interface with prototype and show user's motion.
- Presented prototype to faculty, where team won 2nd prize in Opportunity Fest 2022.
- Continuing prototype development and research with team in the coming months.

DIY Modular Synth – Personal Project **January 2022 - Ongoing**

Personal Project

- Designing synthesizer modules for a Euro Rack modular synth with modules based on STM32 microcontrollers.
- Created modules to take incoming audio signals and transform them based on user input, creating new signal.
- Completed 4-layer PCB design on KiCad based on existing Euro Rack module designs.
- Working on learning embedded C programming for STM32 and finishing PCB designs for remaining modules.

Long Range FPV Drone – Personal Project **August 2021 - Ongoing**

Personal Project

- Built custom drone from scratch using different components – motors, ESCs, flight controllers, frame, GPS, etc.
- Implemented onboard Raspberry Pi computer and front view camera, which transmits live video feed to pilot
- Used INAV software onto flight controller for interfacing with controllers and autonomous flight.
- Working on adding OpenCV AI camera for pose recognition, enabling autonomous flight maneuvers.

VOLUNTEER WORK EXPERIENCE

Vice President of Finance **May 2018 - May 2019**

Mechatronic Systems Engineering Student Society

- Allocated and managed monetary assets belonging to the Mechatronic Systems Engineering Student Society (MSESS) for improving student life through advocacy and events for students.
- Planned SystemsFair 2019, the largest engineering focused career fair in SFU Surrey's history, playing a role as one of the primary organizers for the event.
- Returned largest surplus since creation of the society, which gave the MSESS room for future growth.

Electroencephalograph Data Processing – Lab Assistant **July 2016 - August 2016**

SCORE Program 2016

- Collaborated with experts in neuroscientific medical development working on electroencephalograph (EEG) recording systems that detect neural action potentials.
- Performed data channel analysis with MATLAB scripts, combining industry-standard data manipulation software such as JMP and EEGLab to evaluate latency in recording systems.
- Findings contributed to the research for a head-worn system to rapidly diagnose concussions.

EDUCATION

BASc. Mechatronic Systems Engineering (2017 - Present)

Simon Fraser University

CGPA: 3.38

AWARDS

Dean's Academic Excellence Major Entrance Scholarship (2017) - Simon Fraser University

Dean's Honour Roll (Fall 2018, Spring 2018, Fall 2019) - Simon Fraser University