

# Jian Gao

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<https://Jian-99.github.io/Timeline>

## **PROFILE**

An enthusiastic engineering student, a basketball fan, a member of UBC Aerodesign.

## **EDUCATION**

University of British Columbia

Anticipated Apr 2021

Bachelors Degree of Applied Science, Electrical Engineering (with distinction)

## **SKILLS**

### **Programming Languages**

- C
- Python
- Swift
- HTML/CSS
- SystemVerilog (HDL)
- ARM/8051 Assembly

### **Softwares**

- Arduino
- CircuitMaker
- Matlab
- Quartus/ModelSim
- Solidworks
- SimulationX
- Altium Designer

### **Others**

- Video Editing
- Violin

## **SCHOLARSHIP AND AWARDS**

Dean's Honour List — UBC, Vancouver

May 2020

UBC Go Global Research Award\* (\$1,000) — UBC, Vancouver

Mar 2020

Faculty of Applied Science International Student Scholarship (\$8,500) — UBC, Vancouver

Feb 2020

William McMahan Scholarship (\$1,050) — UBC, Vancouver

Jan 2020

TUM PREP Award\* (€1,000) — TUM, Munich

Dec 2019

UBC Outstanding International Student Award (\$10,000) — UBC, Vancouver

Sep 2017

\*: Corresponding amount was not received due to the cancelation of TUM PREP 2020 caused by COVID-19

## **TECHNICAL PROJECTS**

### **Variable Reluctance Stepper Motor**

Mar 2020

A reluctance motor of a torque of  $0.1N \cdot m$  was designed and built in this project.

- Used FEMM simulation software to determine the size and air gap of the motor
- Waterjet cut the stator and rotor, and 3D printed the casing
- Designed and soldered the control circuit and wrote code in Raspberry Pi

## Coin Picking Robot

Mar 2019

Programmed in C with STM32, a 32-bit Flash ARM-based microcontroller, the robot was designed to pick up all the coins scattered within a  $0.5\text{ m}^2$  area using electromagnets.

- Designed and constructed the mechanism, circuits, and C code for perimeter detector, coin detector and servo motors
- Integrated HC-05 bluetooth module to control the robot wirelessly through our Android terminal

## Heart Rate Monitor with EFM8

Feb 2019

To focus on real-life biomedical applications, a typical heart rate monitor was built using EFM8 8-bit microcontroller. This project was coded in C.

- Assembled the amplifying circuit and the finger clip with an infrared LED and a phototransistor attached on sides
- Set up ADC for signal conversion and EEPROM for storing the past heart rate statistics

## Construction of a CPU in Verilog

Nov 2018

Digging into the operating principle behind a CPU, Verilog was used to build different essential components, such as a finite-state machine, a memory block, a data path etc.

- Configured DE1-SOC's switches and a 7-segment display as I/O wires to data path
- Tested other modules and CPU as a whole using Verilog testbench and a machine code set

## RESEARCH EXPERIENCE

**Smart BCI: Combining Brain-computer Interface and Eye-gaze Tracking to Control Smart Home Appliances — Technical University of Munich** 2020 (cancelled due to COVID-19)

**Facial Recognition and Machine Learning — Sichuan University**

Jul 2019

- Created a standard to accurately describe one's appearance
- Built and trained a neural network to deduce the race, gender, and age of the person

**Quantum Computing and Neural Networks — CSRC**

Aug 2018

- Implemented Gradient Descent to elevate the performance of an existing neural network
- Developed and tested a neural network that determines the possibility of simplification of polynomial equations

## WORK AND VOLUNTEER EXPERIENCE

**Notetaker: ELEC 321 (Stochastic Signals and Systems) — UBC**

Sep—Dec 2019

- Worked with UBC Centre for Accessibility to provide legible notes for students with disabilities

**Volunteer: UK-China Workshop on Employing ICT for Mountainous Rural Community Relief from Natural Disasters — Sichuan University**

Aug 2018

- Participated in guest reception at hotel for the seminar, photo taking and light control

## **ADDITIONAL EXPERIENCE**

### **Competition: SAE Aero Design West — Fort Worth, Texas**

**Apr 2020**

- The competition was changed to an online presentation taking place in June.

### **Design Team: UBC Aerodesign — UBC**

**Sep 2019—Present**

- Built a data acquisition system (DAS) using Arduino
- Developed a ground station which shows the data collected by the plane and its trajectory

### **Hackathon: Rogers 5G Edge Challenge — UBC**

**Oct 2019**

- Used Rogers 5G connection to offload compute to the local MobileEdgeX cloudlet
- Implemented facial and posture recognition in an Android application

### **Workshop: Charging Supercapacitors Using Photovoltaic Cells — UBC/FIT**

**Sep 2019**

- Designed the architecture and circuit for efficiently collecting solar power