Jian Gao

Contact Information

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Education

University of British Columbia, Vancouver
B.A.Sc. Electrical Engineering (with Distinction)
Anticipated Apr, 2021

Honors and Awards

UBC Dean's Honour List (2020)
UBC Go Global Research Award (2020)
Faculty of Applied Science International Student Scholarship (2020)
William McMahan Scholarship (2020)
TUM PREP Award (2019)
UBC Outstanding International Student Award (2017)

Technical Projects

Variable Reluctance Stepper Motor Mar 2020

*A reluctance motor of a torque of 0.1N*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/rotor, and 3D printed the casing
- Designed the control circuit and deployed Raspberry Pi for PID control

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 $0.5m^2$ area using electromagnets.

- Designed the mechanism, control circuits, perimeter detector, coin detector
- Integrated HC-05 bluetooth module to control the robot wirelessly through an 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

UCLA Online, Jun-Jul 2020

A Complementary Approach to Centralized Task Offloading Algorithms in Vehicular Ad-hoc Networks (VANETs)

- Discussed mathematical models for various realistic communication scenarios
- Developed and validated our approach to data offloading for VANETs

Technical University of Munich Munich, Germany, May-Aug 2020 (Cancelled)
Smart BCI: Combining Brain-computer Interface and Eye-gaze Tracking to Control Smart Home Appliances

- Turned into a self-directed learning session due to COVID-19

Sichuan University Chengdu, China, Jul-Aug 2019
Facial Recognition and Machine Learning

- Created a standard that accurately describes oneâs appearance
- Built and trained a neural network to deduce the race, gender, and age of the person

Computer Science Research Center Beijing, China, Aug 2018
Quantum Computing and Neural Networks

- Implemented Gradient Descent to elevate the performance of an existing neural network
- Developed a neural network that determines if a set of polynomial equations can be simplified

Work and Volunteer Experience

UBC Centre for Accessibility Vancouver, Canada, Sep-Dec 2019
Notetaker, *ELEC 321 (Stochastic Signals and Systems)*

- Worked with UBC staff to provide legible class notes for students with disabilities

Sichuan University Chengdu, China, Aug 2018
Volunteer, *UK-China Workshop on Employing ICT for Mountainous Rural Community Relief from Natural Disasters*

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

Professional Affiliations

UBC Aerodesign Sep 2019-Present

UBC Engineering Undergraduate Society Aug 2018-Present

Additional Experience

Competition: SAE Aero Design West
Fort Worth, Texas (Delivered online due to COVID-19) Jun 2020

- UBC Aerodesign: 1st/3rd Place (Regular/Advanced class)
- Built a data acquisition system (DAS) with Arduino
- Developed a ground station which shows the data collected by the plane and its GPS trajectory

Hackathon: Rogers 5G Edge Challenge
University of British Columbia Oct 2019

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

Workshop: Charging Supercapacitors Using Photovoltaic Cells
University of British Columbia/Fukuoka Institute of Technology Sep 2019

- Designed the architecture and circuit to efficiently collect solar power

Skills

Programming Languages:
C, Python, Swift, HTML/CSS, SystemVerilog (HDL), ARM/8051 Assembly

Softwares:
Altium Designer, Arduino, CircuitMaker, Matlab, Quartus/ModelSim, SimulationX, Solidworks

Others:
Violin, Video Editing, English/Chinese/Basic German