CHAEWOON SONG

4th year Electrical Engineering Student
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EDUCATION & ACCOLMPISHMENTS

- University of British Columbia **2017-present**
- Recipient of Outstanding International Scholarship Award **2017**
- Winner of SEDS Canada National Competition **2018**

COOP EXPERIENCE

Incoming Electrical Engineering Intern, Tesla

Feb – Jun 2022

- Joining the Vehicle engineering – Chassis Engineering team as an electrical engineering intern

Systems Engineering Co-op, Corvus Energy

Sept – Dec 2020

- Built both electrical and mechanical systems; from drawing diagrams on Microsoft Visio, to using SolidWorks to build 3D images, as well as from assembling parts to wiring up a system
- Wiring up circuit boards, and PLCs using various wire gauges, ferrules and running simple diagnostic tests using lab equipment such as multimeter and oscilloscope
- Worked closely with control engineers and gained an understanding of control engineering using MATLAB
- Installed and integrated PLCs with the rest of the electrical system, and programmed it using CLICK PLC programming software
- Wrote various Python scripts designed to control Programmable Instruments such as the Rigol DP281A
- Became familiar with various communications protocols such as TCP/IP; and in particular, Modbus communication protocol. I wrote Python scripts that simulate client/server behaviour to test prototype boards and systems
- Became proficient in writing formal documents to both track my own progress as well as to present my work to the rest of the team
- Collaborated closely with many teams within Corvus Energy, including systems, electrical and software which allowed me to articulate my thoughts and idea better, as well as become a better public speaker
- Became familiar with Agile development cycle, as well as version control using Git, and Azure

ACADEMIC PROJECTS

Electrical Systems Engineer and Team Captain, UBC Mechanical Eng Dpt., JustAquaponics

July – August 2020

- Designed and proposed an LED grow light system that is remotely controllable via a localized server using Raspberry Pi's IP address by running Flask app with Python code behind Apache web server. I gained a working knowledge of web development, and Python
- Built a prototype circuit on the breadboard with components such as MOSFTETs and using Raspberry Pi, sent PWM signals via a Python script that is fully interactive on a localized web server. This allowed me to strengthen my circuit analysis skills and become better at hardware-software integration
- As the team captain, I maintained an ongoing communication between my team and the mentors. My primary responsibilities included setting up a weekly virtual meeting with everyone, offer help to my teammates while ensuring that the team stays on task as per schedule, and presenting the final design proposal. I gained excellent interpersonal and communications skills

SEDS Canada National Design Competition, UBC ***Nov 2017 – March 2018***

- Calculated important specs such as required power output, noise, loss and gains, consistent with the previous Mars missions conducted by NASA
- Conducted the study and writing of the power generation systems. Following the previous space mission's specs, I derived approximate power consumptions per satellite, and selected solar panels and Ampere Hour Lithium-Ion Battery as power generation and storage
- Won the competition with the unanimous choice from the Mentors at SEDS

Virtual Robotic Gripper, UBC ***Jan – Apr 2021***

- Spearheaded the mechanical and circuit design in SolidWorks, and CircuitMaker, MultiSim, and UltiBoard respectively, of our project course's SCARA robot
- Spearheaded the selection of motors by calculating how much torque each joint needed to supply
- Implemented inverse kinematics algorithm in MATLAB/Simulink to move our gripper model into a desired location in a simulation software called SimulationX

Simple RISC Machine, UBC ***Sept-Dec 2019***

- Created a Turing complete CPU using Verilog capable of executing a RISC instruction set consisting of encoded assembly instruction. I learned the ins and outs of hardware programming as well as concurrency
- Developed a fundamental understanding in hardware programming and writing test scripts by achieving 100% for every lab project

Coin Collecting Robot, UBC ***March 2019***

- Built a fully autonomous car that detects and magnetically collects coins using microcontrollers, ARM instructions, C/C++, assembly, and embedded systems. I gained a working knowledge of how to use electrical chips and program them

DESIGN TEAM EXPERIENCE

UBC Open Robotics ***Jan – Aug 2021***

- Currently working as a firmware and electronic engineer, working on designing a type of SCARA robot with a gripper. Tools used include Gazebo and MoveIt
- Spearheaded the selection of various robot sensors such as IR sensors, and construction of C++ functions such as distance conversion
- Entered the Robo-cup competition in 2019 by building a humanoid robot with four wheels. I primarily worked on designing the motor driver for the robot, which was composed of many electrical components including H-bridges

UBC Rocket ***Jan – Sept 2021***

- As a part of electrical sub-team of UBC Rocket, I work closely with my team lead in designing PCBs for various parts of the rocket. Most recent work include a breakout PCB, and a PCI connector module. I am able to present these projects upon request
- I gained an extensive experience in circuit analysis by prototyping on breadboard and debugging circuits, using equipment such as oscilloscope and multimeter to ensure that all the components work as expected

UBC SnowBots ***Oct-Dec 2019***

- Led the research of rough terrain motors by exploring stepper motors
- Documented a procedure on how to test the strengths of the stepper motor which was used to educate newly joined members

TECHNICAL SKILLS

- Python
- SystemVerilog
- C, C#, C++
- Altium Designer UltiBoard, MultiSim
- PCB design, circuit analysis
- Raspberry Pi, Arduino, microcomputers and microcontrollers
- Rapid 3D printing using SolidWorks
- Handling lab equipment, Microsoft Office apps, and effective researching

HOBBIES

- Playing soccer, and working out.
- Learning software engineering by doing personal projects: https://github.com/changnoo