Yulim Lee

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Education

Graduated June 2019	**Bachelor of Applied Sciences**, *University of Toronto* Major in Mechanical Engineering, Minor in Robotics and Mechatronics
Mar 2016 & Nov 2018	*George Brown College* Machining Courses: Machining I, Machining III, Welding

Technical Skills

Modeling: Solidworks and Inventor; AutoCAD; ANSYS; PSpice; MATLab & Simulink; Simio
Programming: C, C++, Python, ROS, Git Bash
Microsoft: Word, Excel, PowerPoint
Machining: Lathe, Mill, Drill Press, Welding (Stick, Oxyacetylene), Circle Grinder

Relevant Engineering Experiences

Sept. 2017 – Aug. 2018

Mechanical Engineering Intern, *Isowater Corporation*

- Collaborated with chemical and electrical interns to interpret PIDs, procure parts, and build prototype piping sub-assemblies and frames of chemical process systems.
- Using Inventor and AutoCAD, converted PIDs into 3D models and 2D drawings with enough detail that coworkers and contractors could manufacture with minimal confusion or delay.
- Acted as key point of contact with operator from partner university, troubleshooting issues with a prototype and receiving weekly updates.
- Completed documenting past projects by updating the BOMs and part drawings, finishing incomplete/missing files, and registering all changes into the company database.
- Validated the structural strength of a heavy equipment skid, shipping container supports and customized parts by creating stress calculations spreadsheets and completing FEA on ANSYS.

Nov. 2016 – Aug. 2017

Chassis Fabrication Team Member, *U of T Solar Car Design Team*

- Cooperated with supervisors and fabrication members to construct the hybrid monocoque chassis.
- Fabricated custom carbon fiber and fiberglass composites, from cutting carbon fiber/fiberglass sheets, foam board and honeycomb sheets, applying the epoxy and preparing the vacuum mold.
- Interpreted rough drawings and verbal instructions to mill and lathe custom metal moulds, and laminate sheets. Consulted supervisor for more details to machine the suspension system's beams.
- Enhanced the chassis' aerodynamic properties by sanding and applying filler to smooth plugs, moulds and chassis.

Sept. 2014 – May. 2016

Machinist, *U of T Formula 1 SAE Design Team*

- Machined various steel and aluminum parts using the grinder and drill press.
- Cooperated with others to assemble chassis and structural beams, with rivets and welding.

Relevant Engineering Projects

Jan. 2019 – May 2019

Programming Turtlebot2, *University of Toronto (MIE443)*

- Worked on a team of four to consolidate independently written functions and states, ensuring each would trigger and transition appropriately.
- Determined that a brute force algorithm for the travelling salesman problem was the optimal solution for a path planning challenge and coded it for the Turtlebot2.
- Impressed judges on programming Turtlebot2 to recognizably emote rage with programmed movements and sounds that trigger after sensing a hit.

Jan. 2019 –
May 2019

Lac-Mégantic Derailment Accident Analysis, *University of Toronto (APS440)*

- Collaborated on a team of four to apply Causal Analysis through System Theory (CAST), ensuring understanding of the entire accident and its systemic factors.

- Consolidated information from reports from government boards, organization, and journalists to create Safety Control Structure and System Dynamic Model models of the accident.

Sept. 2018 –
May 2019

Passive Airship Pressure Regulator, *SolarShip & University of Toronto (MIE491)*

- With a four-student team, designed a custom valve to regulate an airship's ballonet system.

- Determined the dimensions of the valve design using force analysis, to meet design goals.

- Assembled, rendered and animated the 3D model in Inventor and Solidworks to ensure the client understood how the concept worked.

- Adhering to a predetermined schedule, provided client with presentations and reports to guarantee their on-going satisfaction with the developing design.

Sept. 2018 –
Dec. 2018

PID-Controlled Pendulum, *University of Toronto (MIE404)*

- On a team of four, accomplished in programming a pendulum with a motor-powered to immediately return to its set angle, static or dynamic, after forced displacement.

- Determined the K coefficients of the PID using both the Ziegler–Nichols tuning method and manual tuning to achieve the desired step response, verifying with physical testing.

Sept. 2018 –
Dec. 2018

Programming a Robot Manipulator, *University of Toronto (AER525)*

- Programmed a SCORBOT-ER 4u to quickly move blocks to positions while avoiding collisions.

- Collaborated with 2 others to verify the maximum velocity and range of the SCORBOT-ER 4u after calculating the theoretical values with forward kinematics and velocity kinematics.

Jan. 2017 –
May 2017

Lap Joint Design, *University of Toronto (MIE320)*

- Cooperated with a partner to improve a lap joint for the greatest ultimate stress per weight.

- Using Solidworks and ANSYS, analyzed the original design to remove mass and reduce stress concentrations by simulating iterations of improved designs.

Jan. 2017 –
May 2017

Heat and Mass Circuit, *University of Toronto (MIE313)*

- On a team of four, established the heat and mass properties of a circuit board through several laboratory tests in order to create accurate models.

- Modified 2D numerical energy balance equations to model in 3D without increasing the number of nodes, reducing both model and code complexity.

- Determined the best arrangement of heat sinks for a circuit board by coding MATLAB scripts that predicted the temperature gradient and verified the accuracy of the simulation via physical testing.

Sept. 2016 –
Dec. 2016

Automaton Nutcracker Design, *University of Toronto (MIE491)*

- Worked with three teammates to redesign a nutcracker toy to emulate a human swinging a hammer down while applying enough force to crack a walnut.

- Created the kinematic stick model of the toy with a kinematic modeling program to verify that the movements realistically emulated human-like motions.

Jan. 2016 –
May 2016

Airplane Stringer Stress Analysis, *University of Toronto (MIE301)*

- Validated stress analysis results by consolidating the data from different methods: finite element analysis, photoelasticity analysis, strain gauge analysis, and tensile strength analysis.

- Collaborated on a team of 5 to summarize the airplane stringer's stress properties in a report.

- Using Excel, calculated the stress for all data points and created graphs to visual represent the resultant stress over time, from each method where applicable.