Matthew Cheuk Yiu Lai

Summary of Qualifications

- Proficient in mechanical design, with experience in rapid prototyping techniques, design for manufacturing/assembly, GD&T, and various CAD softwares such as SolidWorks, AutoCAD, and Fusion360
- Advanced understanding of MATLAB with working proficiency of C/C++ and Python, in addition to hands-on experience with prototyping electronics such as the Arduino and Raspberry Pi platforms
- Well-experienced with additive manufacturing technologies, with exposure to production- and consumer-grade DMLS, FDM, SLA and multi-jetting systems
- Multifaceted approach to problem solving developed through many professional and academic collaborations during the engineering major, in addition to previous terms in the sciences and humanities
- Excellent organizational skills with high attention to detail, ability to work effectively alone or in cooperation with others demonstrated through six co-operative work terms, achieving three Outstanding and three Excellent ranks

Education

Bachelor of Applied Science — University of Waterloo
Honours Mechanical Engineering, Option in Life Sciences — *September 2015 - April 2020*

Experience

Mosaic Manufacturing — Toronto, Ontario
Mechanical Engineer — *May 2020 - Present*

- Spearheaded the design and development of novel 3D printing accessories, enriching Mosaic's product ecosystem and opening more multi-colour and multi-material printing options and opportunities for consumers
- Coordinated with multi-disciplinary teams in both Shenzhen, China and Toronto, Canada for the production of prototypes, including the sourcing and verification of off-the-shelf parts and the manufacturing of CNC components
- Assisted in the testing and validation of various Mosaic products, participating in decision-making processes regarding product launches and marketing campaigns

Pegasus Aeronautics — Waterloo, Ontario
Product Engineering — *May 2019 - August 2019*

- Undertook the manufacturing efforts of Pegasus' most in-demand product, the GE70 UAV range extender
- Independently designed and prototyped new iteration of components with the in-house Tormach CNC mill and Fusion 360 CAM software
- Engaged in expanding the company portfolio through the research and development of novel products and technologies which would benefit and enhance the current roster of range extenders
- Refined quality assurance and increased efficiency with the creation of testing procedures and fixtures

Brachium Inc. — San Ramon, California
Mechatronics Engineering Intern — *September 2018 - December 2018*

- Independently re-engineered and prototyped an integral sub-component of Brachium's automated dental procedure system that enhances user experience, and through internal testing, has subjectively achieved a greater satisfaction and comfort level when compared to the currently used devices
- Piloted the creation of a testing procedure to measure physical flow characteristics of existing and novel dental tools, using a custom-built Arduino shield to monitor inputs and MATLAB scripts to analyze the results
- Collaborated with the design, prototyping, and testing of the robotic end effector through multiple additive manufacturing methods, including SLA, FDM, and DMLS

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Experience (continued)

Multi-Scale Additive Manufacturing Laboratory Waterloo, Ontario
Additive Manufacturing Designer *January 2018 - April 2018*

- Managed the mechanical design of major components and subsystems for a novel directed energy deposition additive manufacturing system developed at the University of Waterloo
- Supported in the design of experiments (DOE) of many projects for industrial partners, including GE Aviation and Lockheed Martin
- Prepared design for manufacturing and assembly (DFM/DFA) models for internal university research groups

The Hospital for Sick Children Toronto, Ontario
Robotics Research Assistant *April 2017 - August 2017*

- Designed and manufactured, through rapid prototyping techniques, surgical tool handles, adapting robotic tools for manual usage
- Contributed to the design and manufacture of novel surgical tools using nickel titanium alloy, assisting in the advancement of minimally-invasive surgical techniques and procedures
- Oversaw all external projects, with assignments including: designing silicon molds, and slicing and 3D printing of skulls for clinical studies
- Managed and maintained manufacturing equipment, including a production grade 3D printer and various CNC mills

3D Print Centre, University of Waterloo Waterloo, Ontario
Circuit Board Manufacturing Engineering Assistant *September 2016 - December 2016*

- Independently managed printed circuit board manufacturing operations and oversaw major 3D printing projects
- Investigated and audited original processes and methods, and established cost-saving techniques while continuously maintaining customer satisfaction
- Developed the concept, with the Dean of Engineering's praise and approval, to add a soldering workshop to the 3D Print Centre; accessible to all students and providing an enabling environment for personal and academic projects

3D Print Centre Engineering Assistant *January 2016 - April 2016*

- Independently managed 3D printing operations and optimized work flow through excellent scheduling and time management skills, resulting in highest-grossing term for in centre history
- Acquired significant knowledge and hands-on experience with professional grade 3D printers through the daily operation and maintenance of two Fortus 360mc printers and one Dimension SST 1200es

Notable Projects

Design of a Liquid Rocket Engine
Fourth Year Capstone Project *May 2019 - August 2019*

- Undertook the task of designing a novel liquid rocket engine in association with the Waterloo Rocketry student team for a collegiate competition
- Independently designed of an injector valve assembly for the engine to sequentially actuate oxidizer and fuel ball valves, which consisted of a air piston-driven rank and pinion mated to a custom Geneva mechanism
- Responsible for all electrical components and assemblies for use in the liquid rocket engine