

SAMUEL ROBERGE-ARNOTT

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SKILLS

- SolidWorks (CSWA certification)
- Fusion 360
- AutoCAD
- GD&T, tolerance stack-up analysis
- Altium Designer
- Soldering & PCB debugging
- Heavy machinery (200+ hrs)
- Metalworking & woodworking
- 3D printing
- Comsol
- C/C++, Python & MATLAB
- HTML, CSS

WORK EXPERIENCE

Mechanical/Mechatronics Engineer – Parallel Systems

Oct – Dec 2022

- Developed a failsafe hydraulic parking brake system capable of holding a 170,000-lb rail vehicle on a 3% grade
- Designed a modular HiPot testing system to ensure proper pin-out and insulation resistance for over 70 unique wire harnesses (some having upwards of 50 pins) eliminating the #1 cause of vehicle bring up issues
- Implemented a high-precision, high-speed torque sensor system on a 250kW electric motor dyno resulting in high confidence powertrain loss characterization

Mechanical Design & Production Engineer – Ekidna Sensing

Jan – Apr 2022

- Improved custom plastic injection moulded part design while preserving efficient manufacturability
- Launched a revolutionary cannabinoid testing device that integrated aesthetics, marketing, and engineering requirements while managing design revisions, manufacturing lots, BOMs, SOPs, production batches, etc.

Mechanical Design Engineer – Tyto Robotics

May – Aug 2021

- Created a servo operated fatigue testing machine successfully characterizing high precision equipment
- Provided critical design changes to custom testing equipment for improved safety and usability
- Devised and conducted testing for multi-thousand-dollar brushless motor and propeller test stands resulting in a 70% increase in thrust and torque measurement accuracy

Hardware Technician, Test Engineering – Sanmina

Sep – Dec 2020

- Provided repair and rework instructions for manufacturing defects of cutting-edge high-speed modem cards in coherent optical modems in a high-tech controlled manufacturing environment
- Analyzed errors and tested optical/electrical components using advanced diagnosis equipment
- Interpreted electrical schematics to debug complex modem cards using standardized approaches

Engineering Assistant – Raufoss Neuman Aluminum

Jan – Mar 2020

- Designed and sourced custom metal components and installations for automated factory process improvements in a high-volume automotive manufacturing environment
- Implemented noise-cancelling fire-retardant industrial curtains for a complex 140-linear-foot installation
- Managed fabrication contracts for goods and services from large and small suppliers

ADDITIONAL PROJECTS

- Developed a hyperloop braking test rig data acquisition system by implementing a shaft encoder & Arduino and conducted R&D for linear induction motor design (Waterloop Design Team)
- Created a 60-foot outdoor stone staircase using heavy machinery for 30 steps of 200-300 lb stones
- Designed and built multiple metal pull-up bars, pine table, wooden squat rack, and other gym equipment

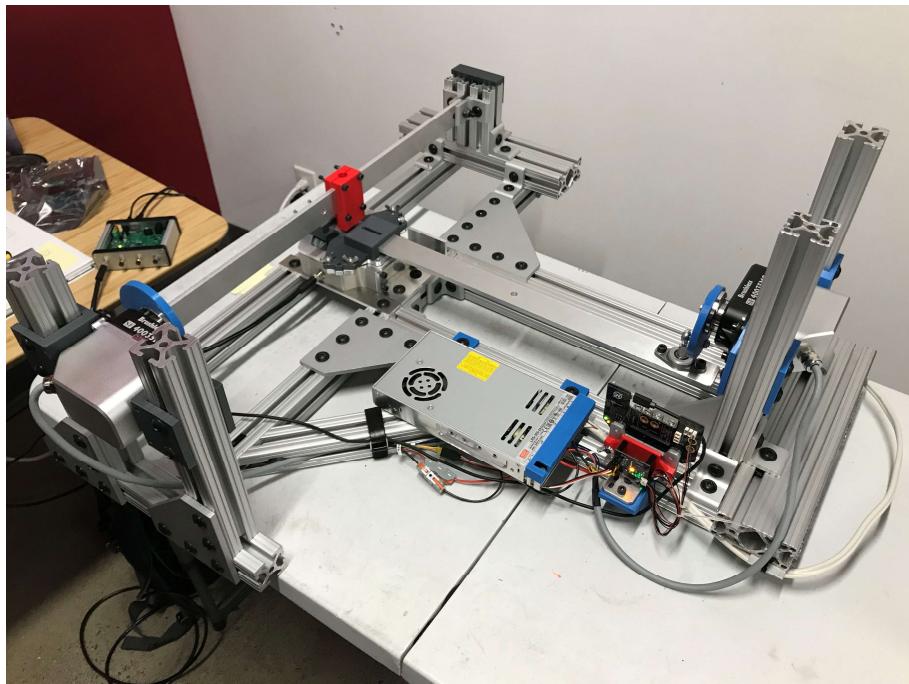
Project Portfolio

Samuel Roberge-Arnott

University of Waterloo, Candidate for BASc - Mechatronics Engineering, 2024

Fatigue Testing Machine for Custom Drone Testing Equipment at Tyto Robotics

I created a custom fatigue testing machine for drone testing equipment. The device under test which would be measuring thrust and torque from a mounted motor and propellor under normal condition, is placed in this machine to simulate the applied load. The servo-operated installation could supply up to 500 N of force and 250 Nm of torque to the equipment under test. The project was completed under fixed budget and time constraints, and required CAD modeling, physics simulations & calculations, supplier coordination, BOM/SOP creation, in-house manufacturing & construction, 3D printing, scripting, testing & validation, etc.



Consumer Product Design and Manufacturing at Ekidna

I was the primary mechanical designer that helped bring to market a revolutionary cannabis testing device. I designed the consumer-friendly testing device and packaging that integrated aesthetics, marketing, and engineering requirements. Project duration was important to meet the product launch date. The device successfully met requirements involving solvent resistance, smooth user experience, sensitive electronics protection, consumer electronics certification, long-term functionality and aesthetic, etc.

I also helped advance the design of a custom plastic injection moulded part to a final manufacturing-ready state. This part is a tube cap that would serve as the key component in the disposable test kit. Cost-effectiveness was a key metric in this design since the part was to be manufactured in the order of thousands. My responsibilities also included managing supplier relations, design revisions, manufacturing lots, BOMs, SOPs, production batches, etc.



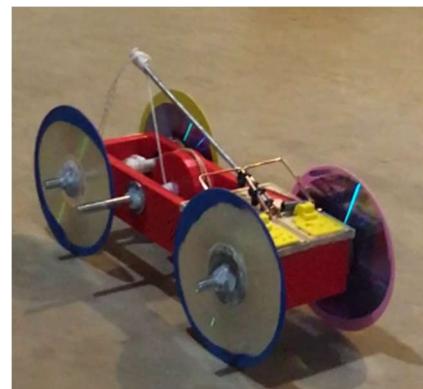
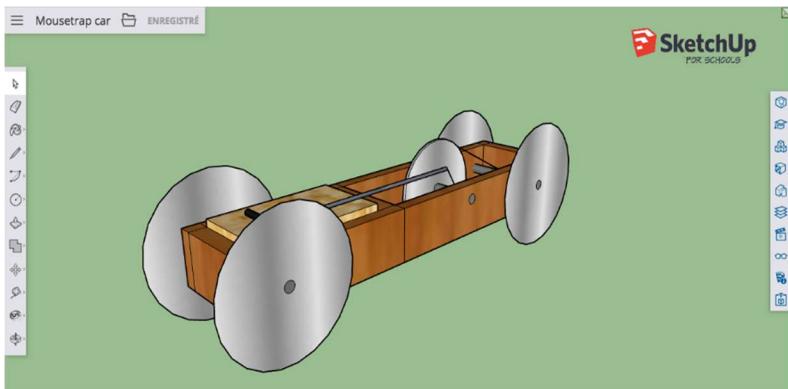
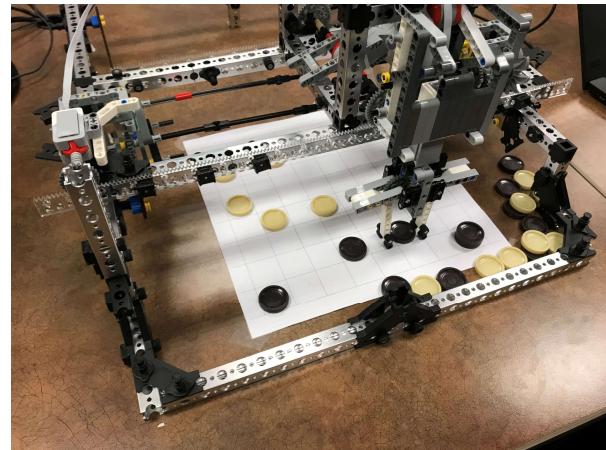
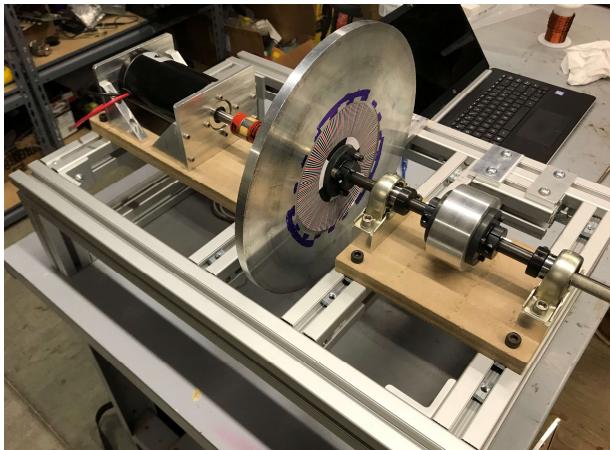
Automotive Factory Expansion and Improvement Projects at Raufoss Neuman

I was responsible for the design of several projects used in the expansion and improvement of automated factory installations. Adherence to safety guidelines and time constraints were important factors in the design process. The projects ranged from existing hardware improvements to custom assemblies and machined parts. Key factors in the design included seamless integration with the production line as well as budget and timeline adherence.



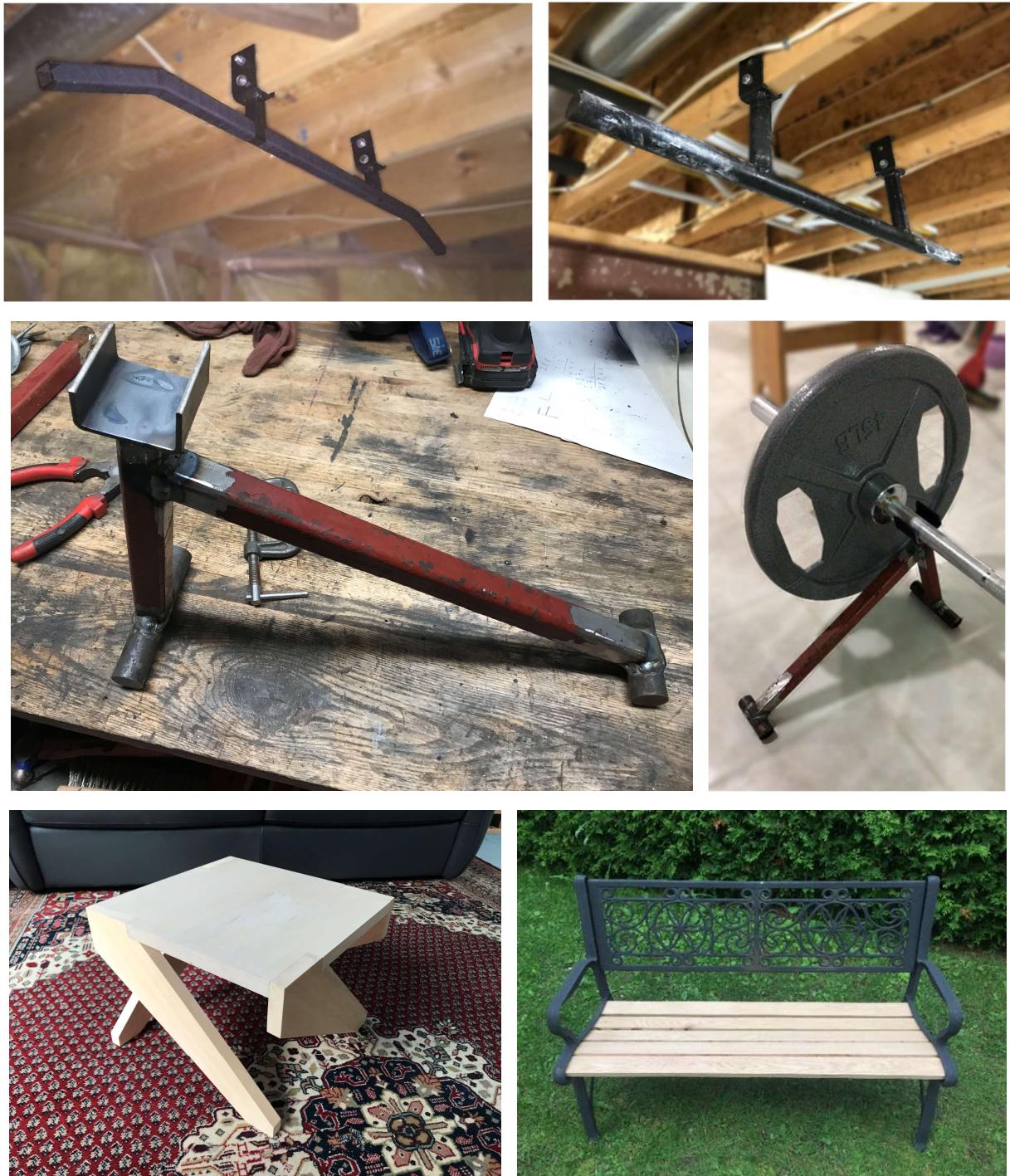
Engineering Design School-Oriented Projects

Academic-related projects include a hyperloop braking test rig, an autonomous checkers robot, and a mousetrap-powered car. Each of these projects were accomplished at different times in my academic career and each taught be valuable lessons.



Metalworking and Woodworking Personal Projects

My personal projects include 3 pull-up bars, a barbell lift, a coffee table, and a bench restoration to name a few. These projects led to great improvements in my metalworking and woodworking abilities using stick and MIG welding, a lathe, hand tools, etc. I really enjoy the hands-on work that was involved with these projects. Immense satisfaction accompanies the transformation of projects from a drawing to a tangible object.



Heavy Machinery Landscaping Project

I accomplished this landscaping project in a team of 3 over the course of a summer on a private residence. I used a 4.5-ton excavator and other equipment to install over 80 stones ranging in weight from 100 lbs to 400 lbs. The staircase has a 20-foot rise, a 60-foot run and has stood up well to the change in seasons since its construction.

