

TAMER SHAHEEN

MECHANICAL ENGINEER



SKILLS

CAD

- **SolidWorks, CATIA V6, NX** used on various projects involving **GD&T, FEA Analysis, sheet metal design** and **plastic injection molding**
- **AutoCAD** and SolidWorks used to draft 2D engineering drawings with FAI dimensions
- High-volume manufacturing methods used on many projects

MECHANICAL

- **3D Printing** and **Laser Cutting** used to rapidly prototype parts
- Created 3D models based on **DFM/DFA** principles
- **Statistical tolerance analysis** on tight tolerance assemblies
- Implemented **Root Cause Analysis, DFMEA** and **FACA** to address design issues

ELECTRICAL & SOFTWARE

- C++, MATLAB, Soldering, Wiring
- Python Programming
- Optical components and optical principles

PROJECTS

HAPEE

- A smart washroom accessory for health monitoring

DRILL GUARD

- Collects dust created when drilling holes

EDUCATION

UNIVERSITY OF WATERLOO

BASc in Mechanical Engineering
Sep 2016 - April 2021

- Excellent Standing
- Overall Average: 86.86%

EXPERIENCE

Serve Robotics | Mechanical Design Engineer | San Francisco Bay Area
Nov 2021 - Present

- Designed subassemblies and robotic parts using **SolidWorks** to be CNC machined and molded following **DFM/DFA** guidelines
- Managed an **EVT** build leading a team of 10+ operators, optimizing the line, and creating detailed **SOPs** to produce a 98.6% yield output
- Created 2D engineering drawings using **GD&T** to control position variability for manufacturing and assembly
- Performed **Root Cause Analysis** on the EVT build line to solve delayed manufacturing times and poor tolerance stack-up
- Designed **IP-67** electronic enclosures implementing O-rings and gaskets, while designing fins to avoid enclosure from overheating

Tesla | Mechanical Design Engineer (Contract) | San Francisco Bay Area
May - Aug 2021

- Designed automotive component parts using **CATIA V6** and launched interior systems for future Tesla vehicle product lines
- Designed parts to be **injection molded, sheet metal formed**, and stamped at a 15% cost reduction by implementing new attachment features, optimizing load paths, and using additional **DFM/DFA** methods
- Built mechanical prototype fixtures using **3D printing** for rapid testing and delivering tangible, early-stage proof-of-concepts

Blendid | Mechanical Engineering Intern | San Francisco Bay Area
Jan - Apr 2020

- Led the product design of a patent-pending drink storage and delivery system using **SolidWorks** and applied **FEA** for design validation
- Used power tools to complete rapid prototyping initiatives to iterate and improve the existing company product
- Improved **DFA** on assemblies by designing parts with minimal reorientation during assembly and implementing self-fastening features

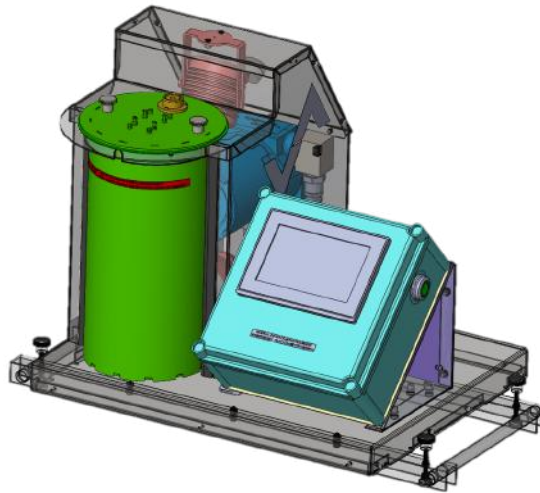
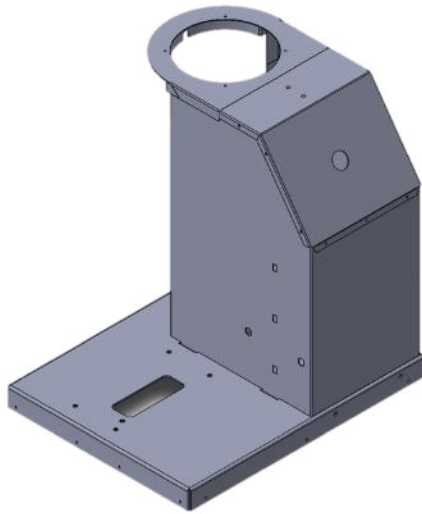
Validere | Product Design Engineering Intern | Toronto, ON
May - Aug 2019

- Led the mechanical design of a Centrifuge Tube Reader; responsible for designing using **SolidWorks**, sourcing, manufacturing, and testing
- Performed **Root Cause Analysis** to assess delayed manufacturing times by implementing a fishbone diagram and the 5 Whys
- Improved **DFM/A** on subassemblies, reducing BOM costs by 35%
- Improved fixture designs by adding self-locating features, reducing CNC setup times by 15%

Ecobee | Manufacturing Engineering Intern | Toronto, ON
Jan - Apr 2018

- Designed and built a test rig using **SolidWorks** and in-house materials to reduce overall light switch production times by at least 15%
- Led the design of a new ecobee4 packaging by performing a cost-benefit analysis with received quotes from Asian suppliers
- Supported all stages of **product development** including conceptual design, EVT, DVT, PVT, Ramp and MP of a smart light switch product

CENTRIFUGE TUBE READER (CTR) - VALIDERE ✓



What?

- Design and fabricate a device that reads the sediment and water quantity in oil with 95%+ accuracy
- Performed a **needs analysis** to initiate the design process

How?

- Used **sheet metal** features in **SolidWorks** to design this
- Applied **GD&T** on all drawings
- Joined flat surfaces via **spot welding**

Results

- The design fulfilled its purpose with 97% accuracy (vs.80% previously when readings were done by humans)

TUBE HOLDER - VALIDERE ✓



What?

- Reduce amount of time it takes to fill tubes with oil
- Minimize human operator error

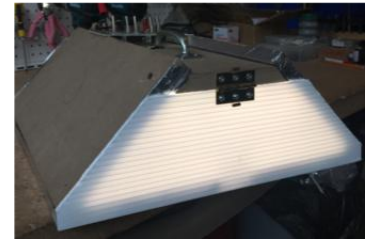
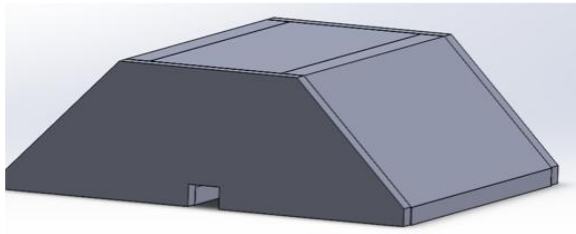
How?

- Designed on **SolidWorks**
- Joined the 4 components that make up the tube holder via **MIG welding**
- Fabricated bends via **break forming**
- **Tumbled** the tube holder to smoothen the rough exterior

Results

- Human operator error was reduced by 53%
- Implemented **DFM** principles to reduce overall part production cost

SOLAR PANEL TEST FIXTURE - AXIS LABS ✕



What?

- Test AXIS Lab's solar panels at various levels in illumination (100 - 5000 lux)
- Minimize amount of faulty products sold to customers

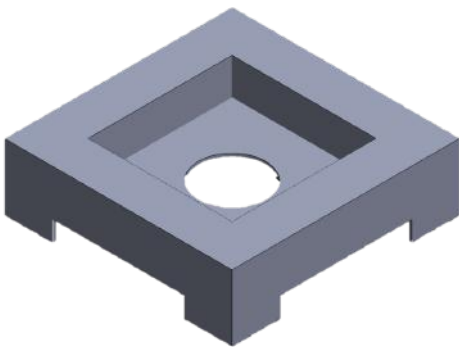
How?

- Used **SolidWorks** to design fixture
- Used **Arduino** for electrical structure
- Implemented **DFA** principles to reduce product assembly cost

Results

- Reduced faulty products sold to customers by 75%

THERMOSTAT PACKAGING - ECOBEE 🐝



What?

- Create a low cost, lightweight packaging for ecobee's thermostat
- Packaging is used to hold the thermostat safely as it is shipped to contractors who are installing it as part of a home renovation

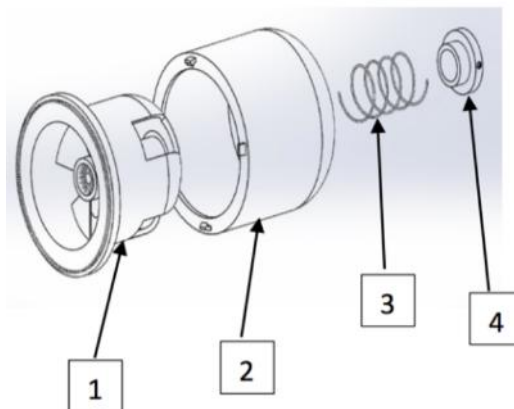
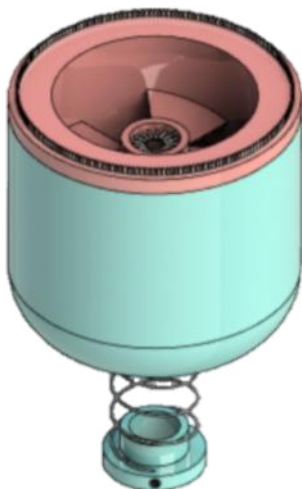
How?

- Used **SolidWorks** to design the outer box
- Contacted manufacturers in China to fabricate the packaging

Results

- Reduced production costs by 62%
- Built relationships with Chinese manufacturers

DRILL GUARD



What?

- Drilling holes results in dust, the Drill Guard collects it

How?

- Used **injection molding** to fabricate this due to the part's complex geometry
- Drill Guard needed to be strong to withstand the stresses caused by the power drill, so injection molding with an added calcium carbonate filler was used in order to improve elastic modulus and achieve the desired strength

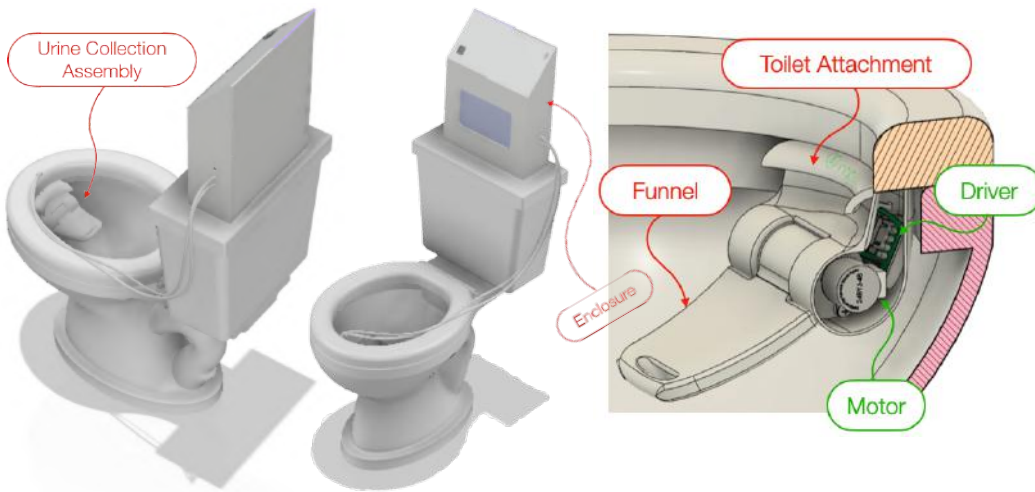
TAMER SHAHEEN

MECHANICAL ENGINEERING AT THE UNIVERSITY OF WATERLOO



HAPEE: HEALTH TRACKING SYSTEM

*click the **hapee** logo to learn more



What?

- hapee is a **toilet attachment** that analyzes urine before it's flushed away to give you the tools you need for **daily health monitoring** and **early disease detection**
- Diseases product can detect include: Dehydration, UTIs, Diabetes and Kidney Stones

How?

- Produced **3D CAD** models and detailed **2D engineering drawings** for Urine Collection Assembly and Enclosure using **Fusion 360**
- Used Arduino and several sensors for electrical infrastructure
- Fabricated using **rapid prototyping** methods (3D Printing)

Results

- Outputted results of urine pH & hydration levels with a 95% accuracy
- Provided users with accurate predictions on dehydration levels and risk of developing kidney stones

