TREVOR HEINEMANN

ENGINEER // DESIGNER

CONTACT

https://www.linkedin.com/in/tmheinemann/

TrevorMHeinemann@gmail.com

https://toremh.github.io/

https://github.com/toremh

28 Stanley Street, Auckland, NZ

(+64) 022-134-2439

SKILLS

Mechanical // Industrial Design

Software Development

Quality Control Processes

Dexterous Robotics

EDUCATION

The University of Auckland

Mechatronics Engineering // Design

Conjoint Bachelor's est. Nov 2024

Mechatronics Engineering
- 60% Mechanical
- 25% Software
- 15% Electronics

Design
- 50% Product / Industrial Design
- 30% Design Process
- 20% Graphic Design

Extracurricular Involvements
- UoA Formula SAE Club
- Web Development Consulting Club
- AU Muay Thai Club (Committee)

LANGUAGES

- Built projects with: C++, Python, Java
- Used in non-software projects: Matlab, SQL, C#
- Workshops/Assignments: Rust, HTML, CSS, JavaScript, C

PROFILE

Engineer and designer with 26 months of cumulative industry experience ranging from machinist to mechatronics engineer. Extensive experience in 3D form and functional design, with a high level understanding of design and manufacturing processes. Also studying and self-teaching software development. Strong data-driven problem solving ability, strong leadership and communication skills, and strong startup born self starting ability.
Note: I have USA citizenship and work authorization.

WORK EXPERIENCE

Tesla Inc.

Mechanical Design Engineer (Intern) Jul 2023 - Feb 2024

Worked at Tesla for 7 months on the 4680 Cell Assembly Manufacturing team as a Mechanical Design Engineering Intern in Austin, Texas. Lead and owned two large projects in quality process development and machine design. Collaborated across several teams, departments, and locations in an extremely fast paced environment. Created data-driven process improvements and pushed changes to live production.

- Redesigned a critical production quality process resulting in ~16% increase in measurement load capability and brought process Cpk above 1.33
  - Designed new fixtures and components
  - Rewrote technical Manufacturing Instructions
  - Procured and installed machines and workstations to 4X initial capacity
  - Conducted repair and troubleshooting
- Designed, prototyped, and tested a machine to automate a routine product safety check, improving accuracy and cycle time.
  - Designed and implemented novel pneumatic seal mechanism
  - Identified a safety issue in live production
  - Selected and worked with an outside vendor for component procurement
- Skillsets: Mechanical design, design for manufacturability, design for assembly, tolerance stackup analysis, geometric (GD&T) tolerancing, material selection, Mfg. statistical analysis (Cpk, Ppk, Gage R&R), design of experiments, root cause analysis, machine data collection (SQL), Jira

Eight360

Mechatronics Engineer (Intern) Dec 2022 - Feb 2023

Eight360 is a New Zealand based VR startup delivering a novel product: A virtual reality simulator in the form of an untethered ~2m sphere with a chair that moves and rotates users 360 degrees in any direction to mimic their movement in VR. Worked for 3 months as one of 11 employees and one of 3 hardware engineers.

- Designed and prototyped from scratch a rotational suspension system with an additional degree of compliance for increased product comfort and stability.
- Identified, proposed, and implemented several improvements to the product and assembly process.
- Skillsets: kinematic analysis, sheet metal design, rapid prototyping, self starting, personal project management, workshop fabrication, aesthetic product design

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EXPERTISE

- 3D Design and CAD Modelling:
  - 1000+ hours professional experience creating parts, drawings, and assemblies in Solidworks, also proficient in Siemens NX (formerly Unigraphics), Autodesk Inventor, Fusion, Onshape, Rhino, Blender
  - Parametric and direct surface modelling experience
  - PDM system experience
- Design for manufacturing, including GD&T drawings and fabricating with:
  - Machining (lathe, mill, 5-axis)
  - 3D Printing (FDM, SLS, aluminum SLM, supports, lattices, layer orientation)
  - Carbon fiber (prepreg layup and wet lamination)
- Design of hand prosthetics and humanlike robotic end effectors

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REFERENCES

Brody Madden - Sr. Engineer at Tesla

brmadden@tesla.com

https://www.linkedin.com/in/brody-madden-3aba4456/

Brian Mongilio - Eng. Director, Aeroviro.

Brian.mongilio@avinc.com

https://www.linkedin.com/in/bmongilio/

WORK EXPERIENCE

Aerovironment (Arcturus UAV)

Aeromechanical Design Engineer (Intern) Dec - Feb: 2019, 2020, 2021

9 months worked over 3 consecutive internships at Arcturus UAV, an aerospace defense contractor which was acquired by Aerovironment during my second internship. Created mechanical designs for components and auxiliary equipment for the JUMP-20 UAV (Unmanned Air Vehicle). Conducted various routine equipment and component verification checks. Designed simple manufacturing equipment.

- Designed and prototyped active aerodynamic cowlings
- Modified the layout and design of internal structural components for use in an experimental version of the Jump-20
- Undertook troubleshooting and transfer of all company CAD data into a Solidworks PDM Vault
- Conducted experiments to investigate in flight sensor issues
- Designed downdraft tables for use in carbon fiber part production
- Skillsets: mechanical design for aerodynamics, design for carbon fiber construction, mechanical electronics integration

Designit Prototype

Machinist (Full Time) Jul 2018 - Jan 2019

Worked 7 months as a full time machinist at Designit Prototype, a relatively small local machine shop focused on low volume prototyping. Operated a Haas VM-3 CNC vertical mill predominantly, occasionally operated a lathe.

- Completed the planning, setup, and machining of countless parts for medical devices, aerospace, etc. hitting tolerances as low as +-1 thou (+-.03mm)
- Conducted first article inspection of parts to confirm dimensions

Academic Projects

See Github or Website for details

- Development of a robust, roller chain driven prosthetic finger
  - (In progress, paper pending) Solidworks, 3D printing (SLS), Silicon molding
- Emotionally responsive VR environment for individual mental health practices
  - (In progress) Unity,
- Robotic scanning, pathfinding, and object avoidance in a dynamic environment.
  - C++, Arduino, Solidworks, 3D printing, breadboard electronics
- Fantasy themed virtual reality escape room
  - Unity, C#, Blender
- Processing animations built up from the pixel level
  - Java, Processing (language)
- OOP Course projects: Traffic simulator, set calculator, activity tracker
  - C, C++, OOP development
- Real Time Systems Course: Finite state machine, Arduino traffic light
  - C, C#, inline assembly (ASM), register manipulation, multithreading