Yaron R. Adar

Design Engineer

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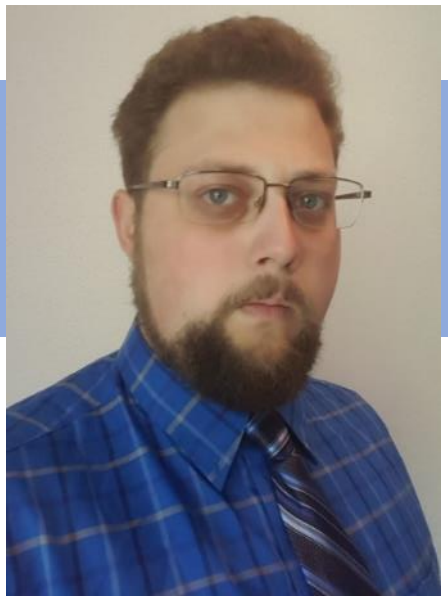


YaronAdar.com

Contents

Professional Summary

I am a Mechanical Design Engineer committed to developing excellent devices with excellent practices. My primary skills are in developing mechanical assemblies & components of devices from concept to manufacturing, and my work benefits from a diverse background of Engineering experiences and education. I have completed numerous development projects both independently and in collaboration with diverse teams.

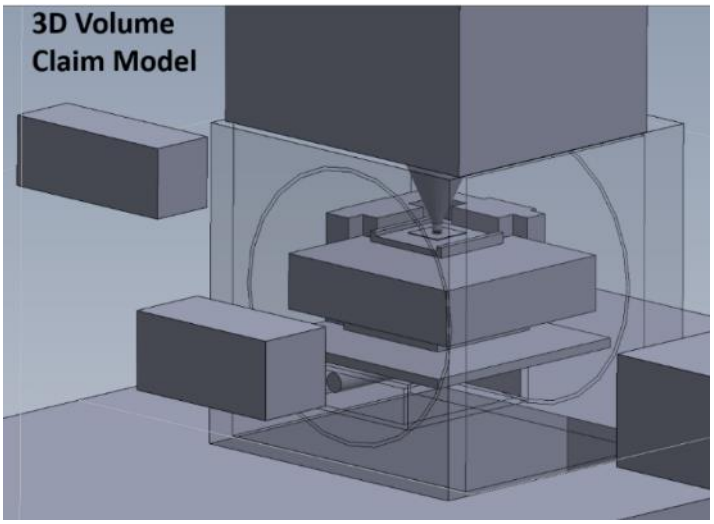
I am currently seeking project work in Mechanical Engineering and Design as an independent contractor. I am available in-person to South Holland, Netherlands, and I am equipped for remote work otherwise.

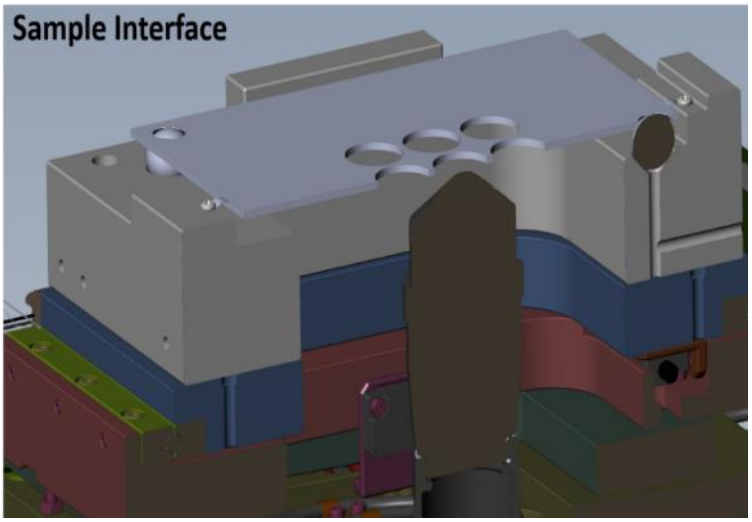
Freelance Mechanical Design Engineer

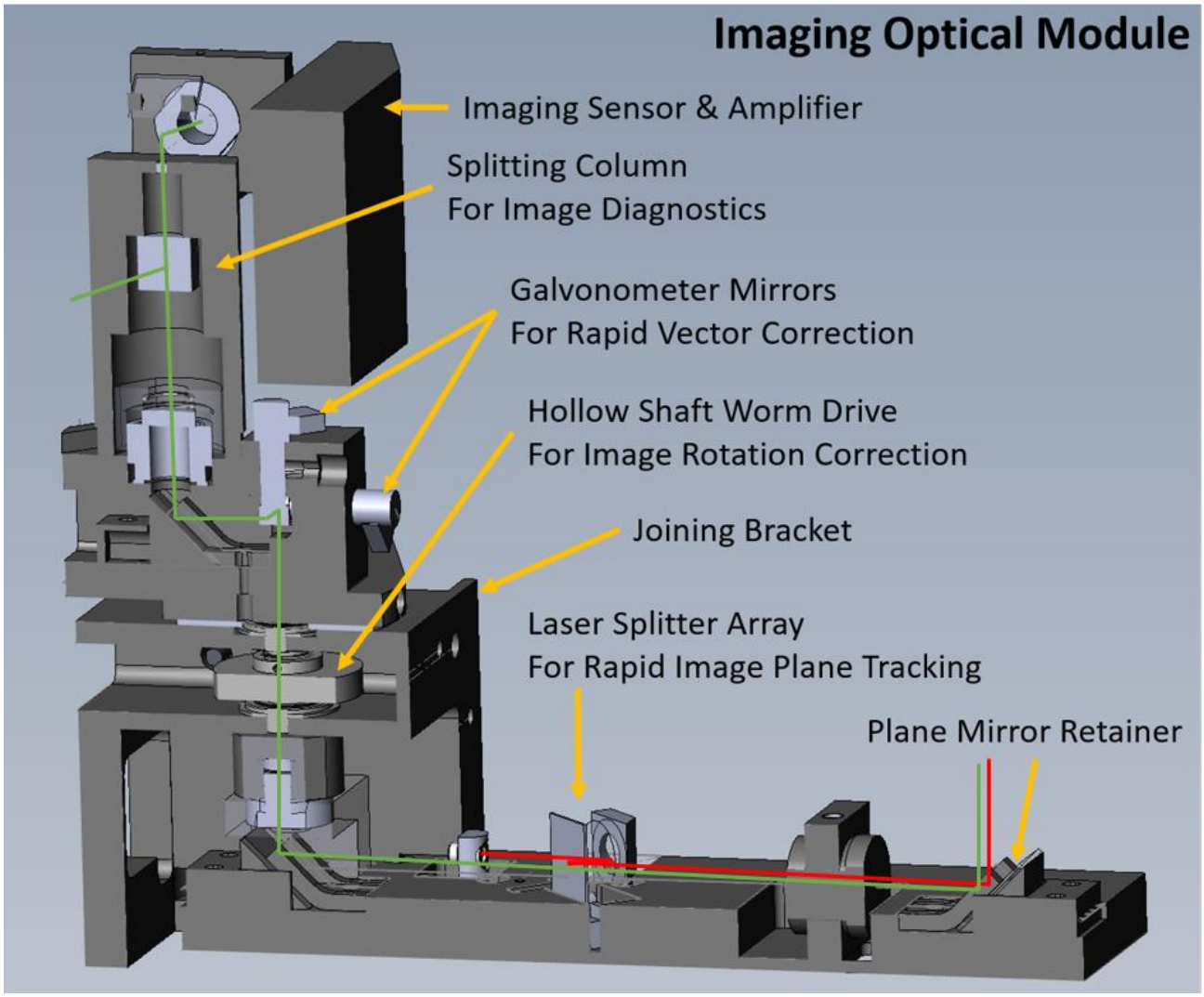
2019-Present

Delmic, Project Sonic

I developed optomechanical modules from concept to detailed design for an innovative scanning electron microscope alongside a team of specialists in optical and metrology systems. Gained familiarity with high precision mechanical design and optical alignment methods.







Freelance Mechanical Design Engineer

2019-Present

Stryker, Project Smoke

I developed the design history file for an electromechanical vacuum-suction medical device to the customer's corporate and regulatory (FDA, EU MDR) requirements, including the design inputs/outputs (DIOVV), failure modes (FMECA), architectural requirements, engineering design description, design verification plan, product standards & VOC assessment, and intended use.

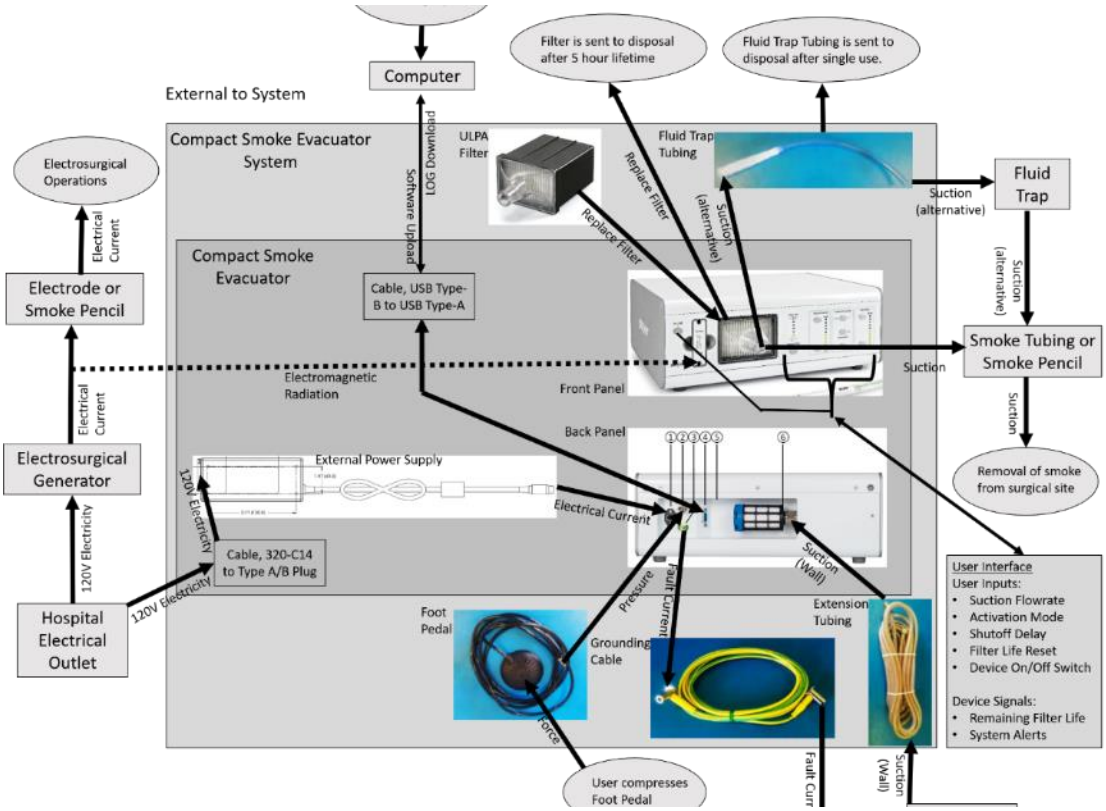
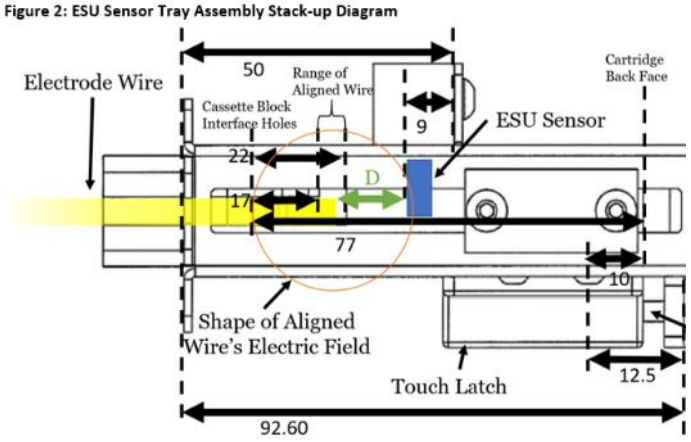


Figure 2: ESU Sensor Tray Assembly Stack-up Diagram



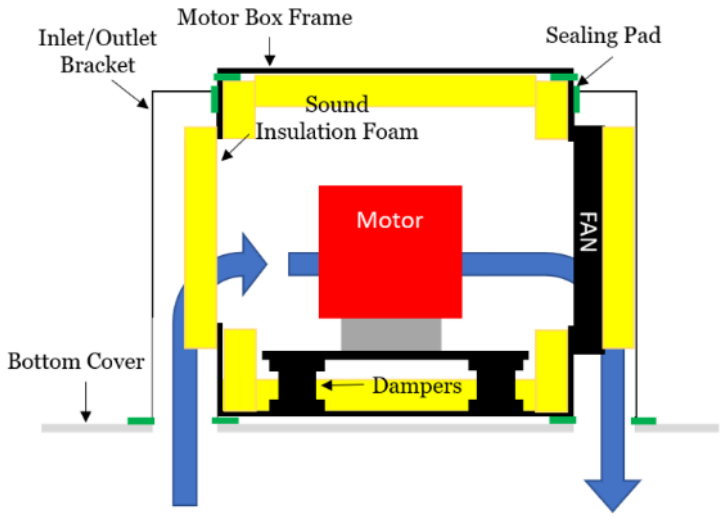
A diagram showing the dimensions used to calculate the range of possible wire-to-sensor distar
Dimensions are from LiNA drawings of components of the H-1601 Sensor Tray Assembly.

Motor Box Cooling & Sound Insulation

A cooling fan is mounted on the Motor Box to produce a flow within the Motor Box which limits the temperature rise of the Motor by convection cooling. The flow passes from an inlet bracket duct, across the motor, and is exhausted to an outlet bracket duct as shown in Figure 5. Sealing pads are applied to the Motor Box edges to prevent leaks that would detract from the convection flow with sealing compression applied by screws. Motor temperatures of up to °C were recorded during Life Testing.

Polyurethane foam covers the effective surface area to of the Motor Box to absorb sound waves. The foam must be open cell to allow passing of air flow. Dampers between the Motor and the Bottom Cover reduce the amount of sound produced by absorbing Motor vibrations before they conduct to the device's frame.

Figure 5: Vacuum Pump Convection Flow and Sound Insulation



Stryker Instruments

2016-2019

Product Engineer

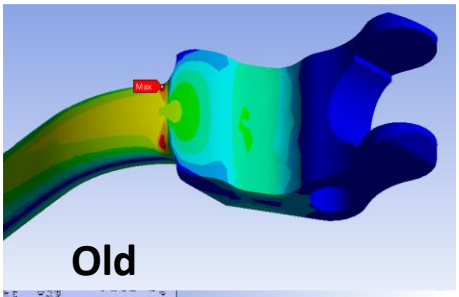
I was responsible for the continuous improvement of medical device designs as well as Design Engineering support of Manufacturing, Marketing, and Regulatory sustainment activities.

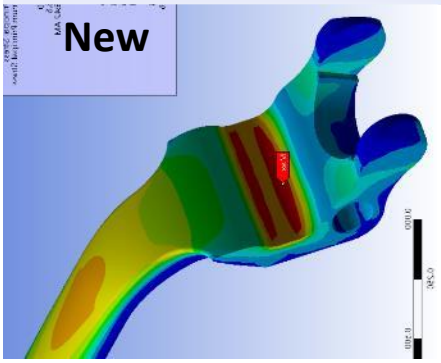
Orthopedic Power Tool Systems

Orthopedic Cement Guns & Vacuum Pumps

Metal Transformation Project

Conversion of 15 components to Metal Injection Molding (MIM) production. Gained skills in assessing & developing components for molded processes. Collaborated with external suppliers and internal subject matter experts to develop functional outputs from advanced manufacturing processes.





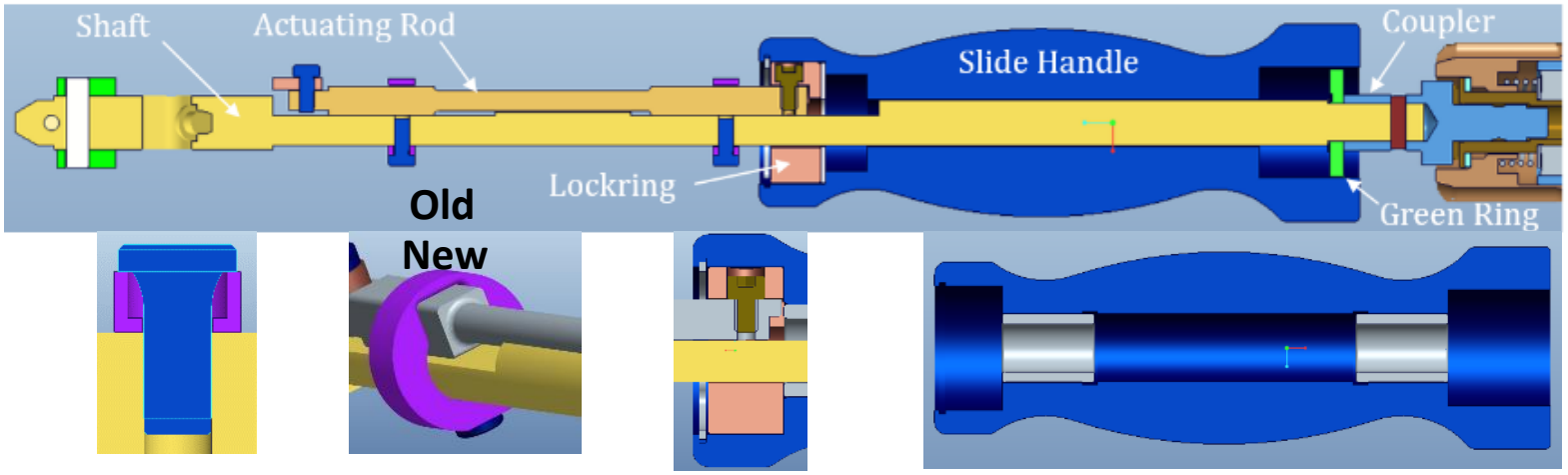
Stryker Instruments

2016-2019

EZout Design Improvements

Developed several simultaneous changes to extend the performance of a powered mechanism. Designed and led device testing from investigation to verification.

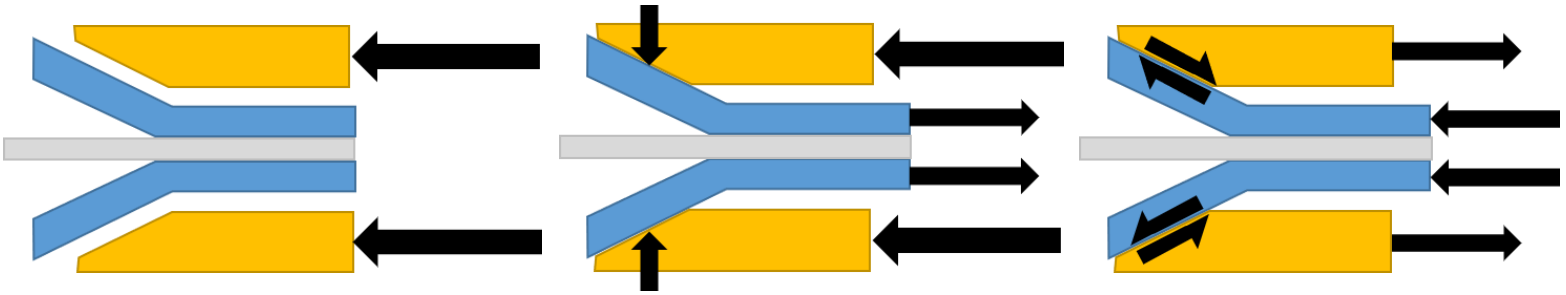
- Designed and verified a system of solid polymer plain bearings to replace wet lubricant.
- Revised the geometry of the actuating linkage and lockring to reduce contact pressure.
- Optimized a sensitive mechanical assembly for manufacturability using a tolerance stack-up, GD&T, and a CAD PDM (Creo) in collaboration with several external suppliers.



Jamming Failure Investigation

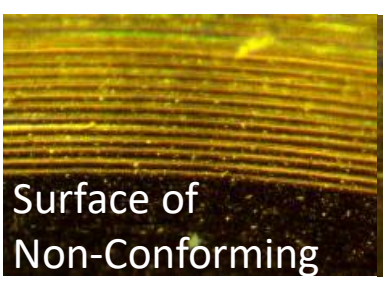
Summary of a design root cause investigation I led:

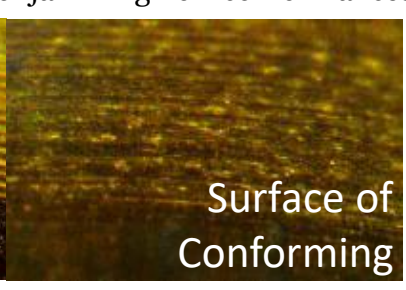
1. Production of a device experienced spikes in QC failures for jamming non-conformances.
2. Testing along a 5-Why cause analysis narrowed the root cause to a cup-wedge collet interface.
3. Testing & observation of the failure suggested the current surface finish design controls were insufficient to allow separation of the interface by the return spring, illustrated below:



4. Applying a familiar low-friction coating to this interface successfully eliminated failure in previously non-conforming samples.
5. The coating was verified for long-term performance and implemented in production.

Result: Total elimination of jamming non-conformances over the 6-month observation period.





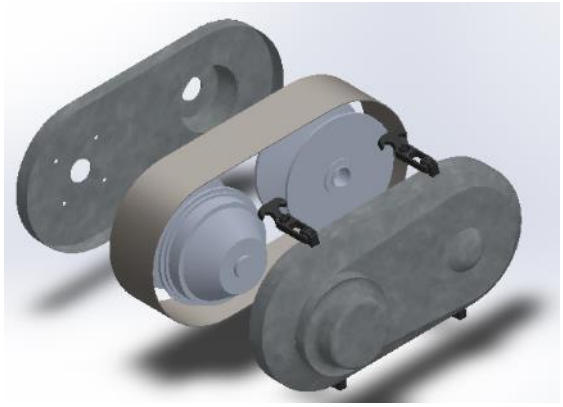
University of Rochester Baja SAE Design Team

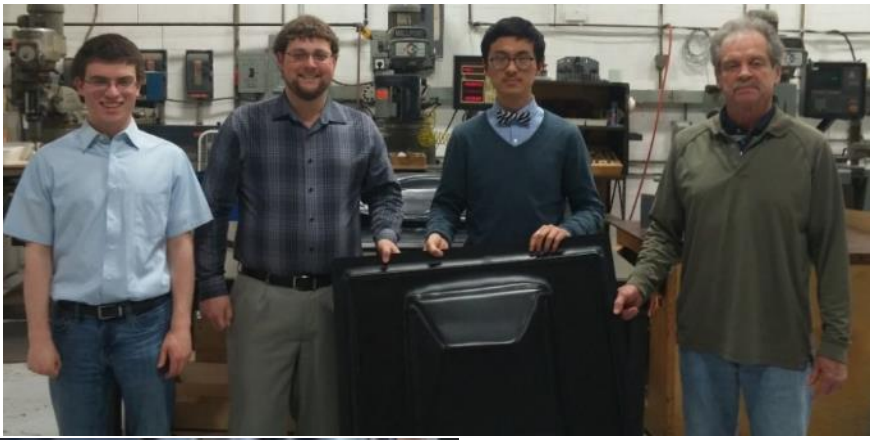
2011 - 2016

My responsibility as Project Team Leader for the University of Rochester Baja SAE design team was the development and production of custom shell & coverings to strict Baja SAE regulations. Vehicle cost, weight, and aesthetics were judged at annual national competitions.

Excellent Teamwork and Leadership were paramount to our success. We shared a living assembly model through SolidWorks PDM. I regularly trained members on new and traditional manufacturing methods.

By introducing the team to new materials and developing new molded manufacturing methods for fiberglass and thermoplastics, I greatly advanced our shell-part manufacturing efficiency, quality, and capabilities. All of the designs presented next were enabled by that effort.





Hi-Fi Prosthesis Scannable Jig

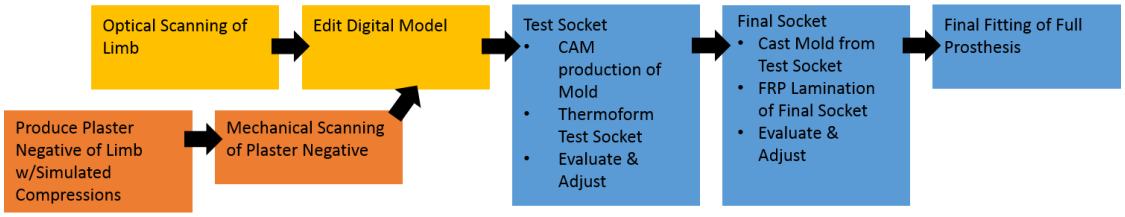
June - August 2014

Project Overview

I was hired by Optimus Prosthetics to develop a custom version of the Imager compression-pattern jig used in High Fidelity™ Interface prosthesis socket production to the desired specifications and improved patient comfort.

Image from biodesigns, Inc. website

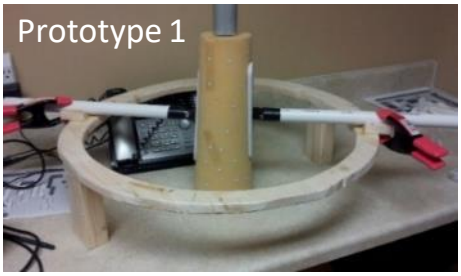
Typical Optimus Workflow

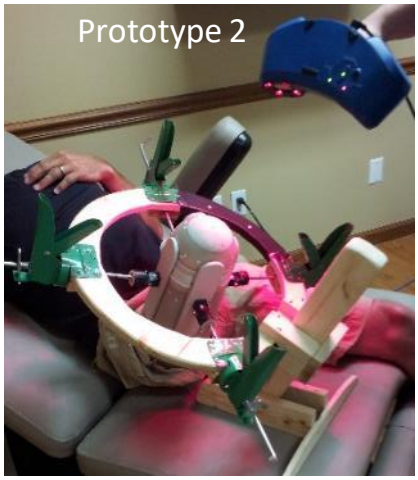


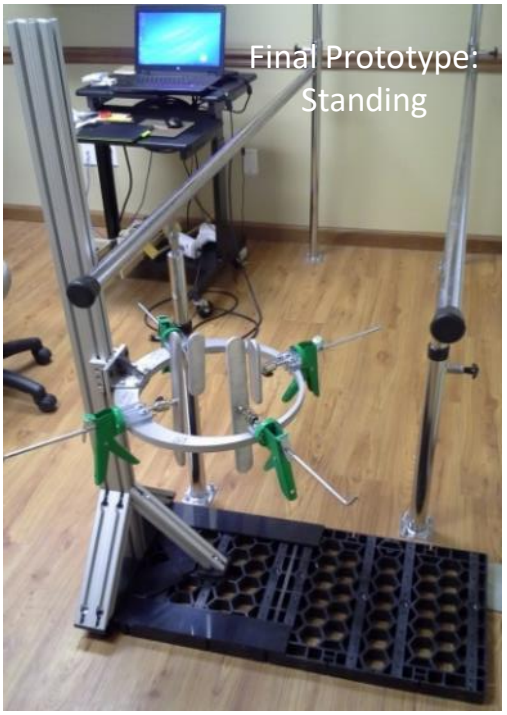
Original Hi-Fi Workflow

Exploration of two design concepts: a new wrap-type jig and the traditional frame-type jig

The Frame-Type Jig produced a much more uniform and predictable compression pattern. It was developed to specifications as iterated prototypes into a two deployable variations: The Standing Jig and the Seated Jig.



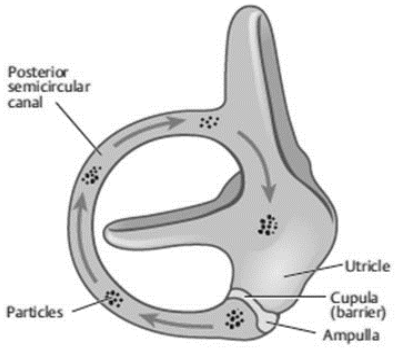




A Device to Assist Canalith Repositioning Treatment for BPPV

2014 – 2015

Project Overview

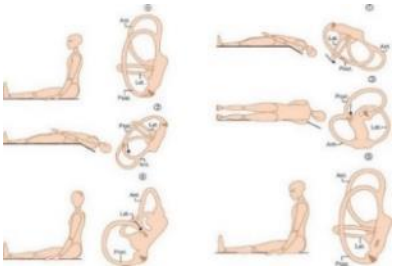


C. Principle of repositioning.

Image from UNC School of Medicine website, "Benign Paroxysmal Positional Vertigo (BPPV)"

A local otolaryngologist commissioned my senior design team to develop a clinical device that universalizes access to the extremely efficient Canalith Repositioning Maneuver (CRM) treatment of Benign Paroxysmal Positional Vertigo (BPPV), a disorder of the inner-ear canals common in elderly people.

Traditional CRM



"The Epley's maneuver (CRP) for left PSC BPPV" from *Alaska Neurologist* on Pinterest

360⁰ CRM

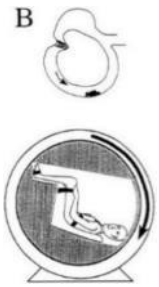
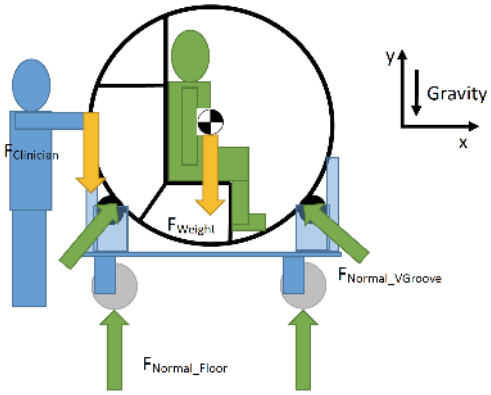
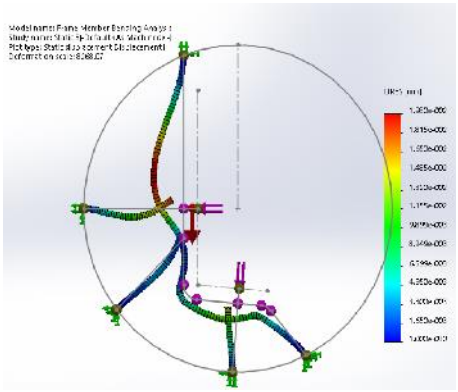
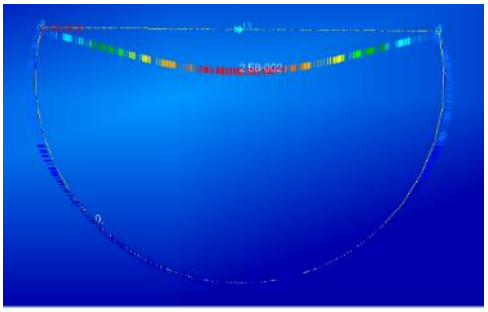


Image from "Three hundred sixty-degree rotation of the posterior semicircular canal for treatment of benign positional vertigo: A placebo-controlled trial." by Lampert et al.

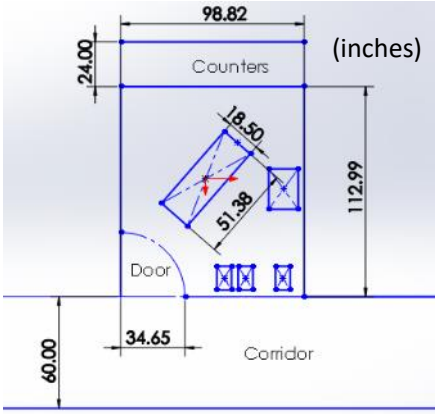
Seven concepts were evaluated on several factors, including a Bayesian prediction of how many BPPV patients could be serviced. The 360⁰ CRM concept was then developed through analyses and validation prototypes.



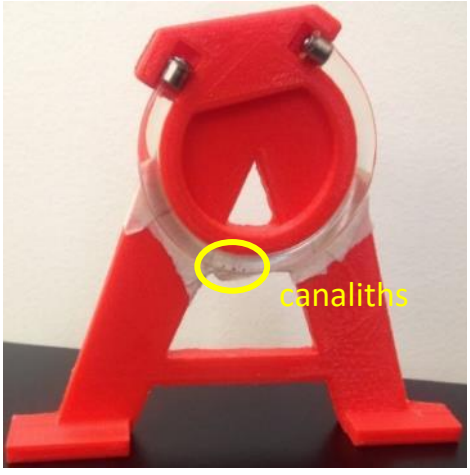




Maneuverability Validation



Efficacy Validation



Half-Scale Prototype

Curriculum Vitae of Yaron Adar

Dutch Pronunciation: [Jah-roon Aa-daar]

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Born: January 18, 1992
Nationalities: American, Dutch, Israeli

Work Experience

Yaron R. Adar – Freelance 2019 - Present

Mechanical Design Engineer

Design development, drafting, and documentation on a project basis. Machine design, product development.

Delmic, Microscope Development Project

Responsible for the development of optomechanical modules from concept to detailed design for an innovative SEM microscope.

- Integrated mechanical, optical, and metrological functions through optomechanical tolerance & performance analyses to meet nanometer-, micrometer-precision requirements.
- Produced component specifications and drawings using geometric dimensioning and tolerancing.

Stryker Instruments, Suction Medical Device Acquisition

Developed a post-market design history file for an electromechanical vacuum-suction medical device.

- Produced design inputs/outputs (DIOVV), failure modes (FMECA), architectural requirements, and other documents to the customer's corporate & regulatory (FDA, EU MDR) requirements.
- Assessed, remediated existing specification and testing documentation to meet corporate and regulatory (FDA, EU MDR) requirements.

Stryker Instruments – Kalamazoo, Michigan, USA 2016 - 2019

Design Engineer (Mechanical)

Post-market development of innovative Orthopaedic surgical instruments and operating room equipment for a large international manufacturer.

- Responsible for continuous improvement and remediation of medical instrument designs.
- Design support of Manufacturing (internal processes, external suppliers, manufacturing transfers), Quality Control, Supplier Sourcing, Regulatory Compliance, and Marketing activities.
- Wide range of mechanical & statistical analyses, product performance testing, risk management, and root cause investigation.

University of Rochester Baja SAE Design Team – Rochester, NY, USA 2011 - 2016

Member, Project Team Leader

Designed and built competitive off-road vehicles with a diverse student team.

- Developed innovative parts and manufacturing processes in strictly budgeted development cycles.
- Gained Design for Manufacturability knowledge alongside machining and manual fabrication skills.
- Developed excellent teamwork and organizational abilities to develop a complex system.

Optimus Prosthetics – Dayton, Ohio, USA 2014 (3 Months)

Engineering Intern

With the Clinical Manager and manufacturing laboratory, developed a limb prosthesis fitting tool that integrated CAD & CAM of High-Fidelity™ sockets into existing clinical processes.

WFU Center for Injury Biomechanics – Winston-Salem, NC, USA 2013 (4 Months)
Undergraduate Intern
Assisted the Orthopedics Laboratory's research of surgical specimen mechanical properties and exercise biomechanics. Design of MRI-compatible equipment and modelling of MRI scans.

Education & Certifications

University of Rochester 2011-2016
B.S. in Biomedical Engineering, Concentration in Biomechanics, received May 2016
Minor in Computer Science, Cluster in Dance Improvisation

- 166 Degree Credit Hours (approx. 277 ECTS credits) plus 36 Business Credit Hours
- GPA of 3.3/4.0
- Kauffman Entrepreneurial Year Scholar, 2015-2016

Coursework: Statics & Dynamics, Solid & Fluid Mechanics, Thermodynamics; Circuits, Signal Processing; Mechanical Design, Biomedical Design; Statistics; Materials; Engineering Computing.

New York State E.I.T. July 2016
FE Mechanical passed, ID# 1664206

Hobbies & Activities

Developing my balcony garden
Turning junk into fun electromechanical contraptions
Learning Dutch

Key Skills & Competencies

Languages Spoken: English (native), Spanish

- Developing design requirements and concepts.
- Prototyping and statistical test verification.
- Mechanical analysis of structures & mechanisms
- Knowledge of metals, polymers, composites.
- Design for Manufacturability (machining, metal & polymer molding, rapid prototyping).
- Product and process failure mode analysis.
- CAD: Drafting with GD&T, 3D Modelling (SolidWorks, PTC Creo, Siemens NX).
- Laboratory research/testing.
- Familiarity with regulated industries and quality management systems.
- Teamwork with diverse teams and Professionals (Business, Research, Medical, Manufacturing).
- Programming skills in multiple languages.
- Technical writing including reports, manuals, and protocols.
- Presenting orally to different audience types.
- Meeting deadlines for simultaneous activities.
- Planning, leading product development projects.

References Available Upon Request