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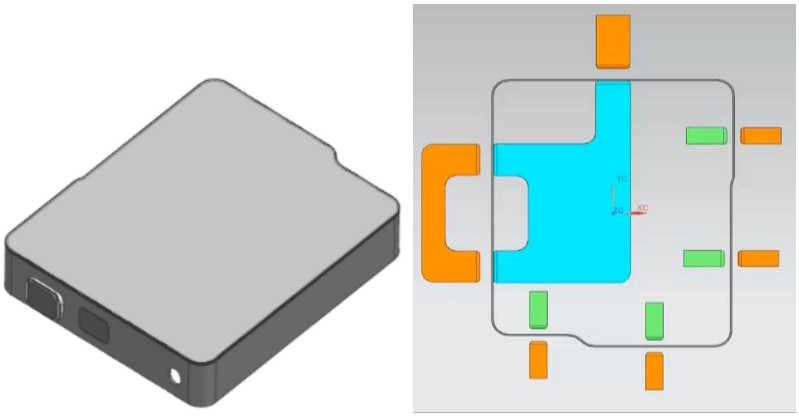
DESIGN AN FIXTURE APPLE WATCH BATTERY @Apple - *September 2024*



What?

- Develop an inspection fixture to inspect **flexible frames of thickness 150 microns**.

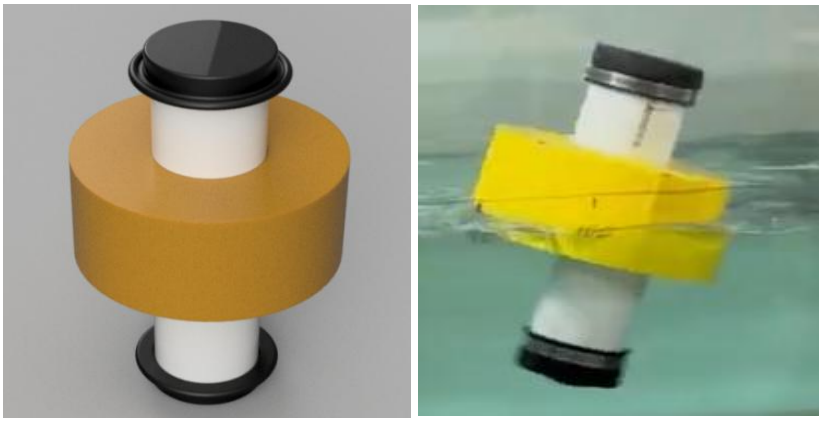
How?

- Developed a **displacement-controlled inspection fixture** to inspect frames before battery assembly.
- Conducted tolerance analysis to ensure fixture tolerances captures variations in incoming parts.

Results

- Inspection fixture with **5-micron tolerances** was commissioned to the production environment in China to inspect & qualify flexible frames for **Apple Watch batteries**.

DESIGN AND FABRICATION OF A WAVE DRIFTER @UCSD - *March'24*



What?

- Design and fabricate a **wave drifter** to measure ocean currents in a team of 5.

How?

- Used **Fusion 360** to design electronics enclosure and used **FDM printer** to 3D print parts.
- The design is made of PVC pipe and drain plugs with a Surlyn foam used to keep it afloat.
- Used **Arduino Mega**, **IMU** and **GPS** to track the position of the drifter when deployed in the ocean.

Results

- The design was proved **water resistant** when the drifter survived in the Pacific Ocean for **2+ hours**.

HAPTIC BOXING GLOVE @UCSD - *March'23*

What?

- Design and fabricate a **boxing glove simulator** that provides haptic feedback when interacting with the virtual environment in a team of 3.

How?

- Used **SolidWorks** to design the components of device and 3D printed parts on a **FDM printer**.
- Used **Arduino Mega** and **motors with encoder** to control the position of device in real-time.
- **Processing** was used to render and display a boxing glove and punching bag.

Results

- The final product worked successfully when tested on **12** different users with various fist sizes.

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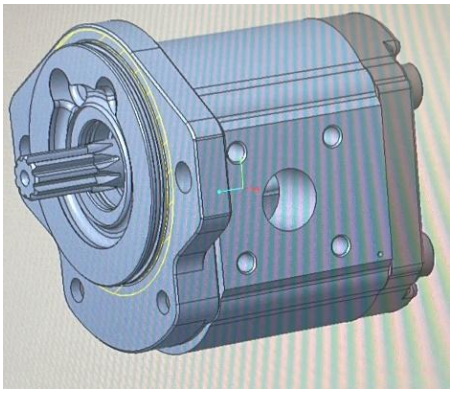
DESIGN OPTIMIZATION OF GEAR PUMP @REXROTH BOSCH - *January'22*



What?

- Optimize the design of a **gear pump** to reduce the material to make the pump cost effective and lightweight to reduce annual production cost.

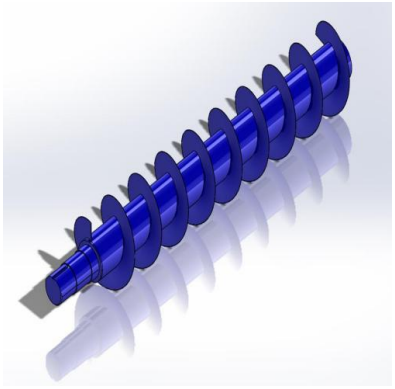
How?

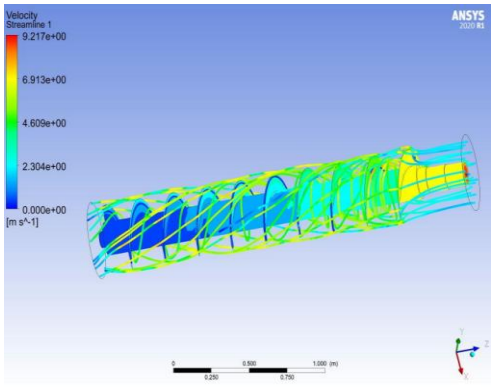
- Used **PTC Creo** to design 3 different prototypes of the gear pump and used **GD&T** on the drawings.
- Used **FEA** to understand various fracture points of the pump.
- Tested the prototypes on a test bench for 100 hours to obtain the optimal design.

Results

- Implemented **DFM** principles to reduce production cost by **$1.2M**.

VANE DESIGN OF A SPIRAL WATER TURBINE @VTU – *June'21*





What?

- Design the **vanes** for a low-cost spiral water turbine to generate power for household applications in a team of 4.
- Simulated various flow velocities to understand the behavior of the vanes.

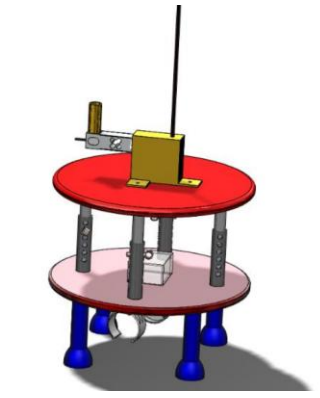
How?

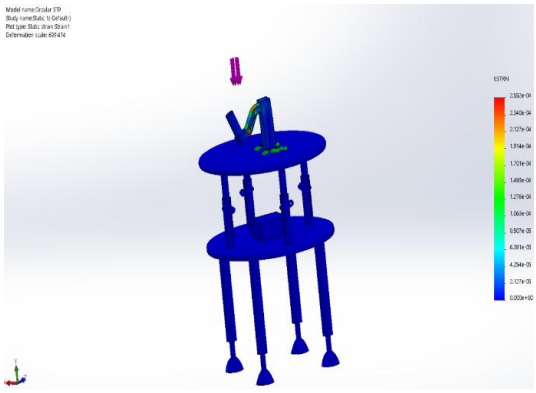
- Designed the vanes on **Solidworks**.
- **ANSYS Fluent** was to simulate the blades at various flow velocities.

Results

- The final design blade design was simulated at 15m/s, 20m/s, and 25m/s to visualize flow.

STATIC TEST PAD FOR ROCKET MOTOR @STAR - *December'20*





What?

- Designed a **Rocket Motor Static Test Pad** for testing and collecting data to analyze the performance of the high-powered rocket motors.

How?

- Designed the components of the test pad on **Solidworks**.
- Used **FEA** in **SolidWorks** to calculate the maximum load the test pad can handle.

Results

- The test pad can handle up to **150N** which displays a good strength to weight ratio when simulated at various loads.
- The design is ergonomical to transport and reuse at ease.