

Background Research Presentation

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Project Description

My project is going to reverse engineering my watch in two different parts.

Part 1

- 3D printed watch, custom watch band, rough measurements, example of additive manufacturing.

Part 2

- More detailed, only CAD version. Detail of inside watch movement. Animation + Video, full rendering in program.

Why?

I chose this project because I have always been interested in watches, and I wanted to incorporate what I have learned in drafting.

- The goal of the piece itself was to use a little bit of everything I've learned. The 3D printed piece uses features like the swept blend and custom design in the band.
- The more detailed CAD version will have assembly features and texturing, as well as animation.

The overall measurements, design process, research, etc. is all inherently linked to the engineering process, which is what I plan to go into.

Research

My research wasn't explicitly linked to my project, but I did learn a bunch that will help with problem solving and engineering design in the future.

- Experimentation is a very important part of the design process.
- No design will ever be perfect, sometimes you have to settle for a workable piece and revise it later.
- No method of manufacturing is perfect, for example small thin pieces are brittle with the 3D printer.
- Proper texturing can make a CAD design look like real life, but is also very difficult to make it look accurate.
- Real life models are much easier to interpret than 3D CAD drawings, but lack convenience.

Research (cont.)

- The frames per second of an animation directly translate to how natural the movement looks.
- The inside movements of watches can become incredible complicated based on the number working pieces. Can go to 100+ pieces of varying sizes.
- Creativity is an essential part of problem solving in engineering, and often helps you find alternative or groundbreaking design.
- Problem solving, and creativity, are not as abstract as most people think, and there are methods to utilize them effectively.
- Trial and error is necessary in design and problem solving, the first solution is almost never the best.

Physical Project

The physical part of the project is the first part I described earlier.

I'm going to make a semi-accurate replica of my own watch, 3D print and assemble it, and wear it during the presentation.

The watch won't actually work, it will be more for the design and to show the extent of 3D printing capabilities.

Plan

1. Main Body - DONE
2. Watch Band - Jan 14
3. 3D Print - Jan 21
4. Final details / Completely Finished - Jan 28
5. Glass Top + Texturing of body - Feb 4
6. Watch Movement (all pieces finished) - Feb 25
7. Assembly of Movement - March 4
8. Texturing - March 11
9. Animation - March 18