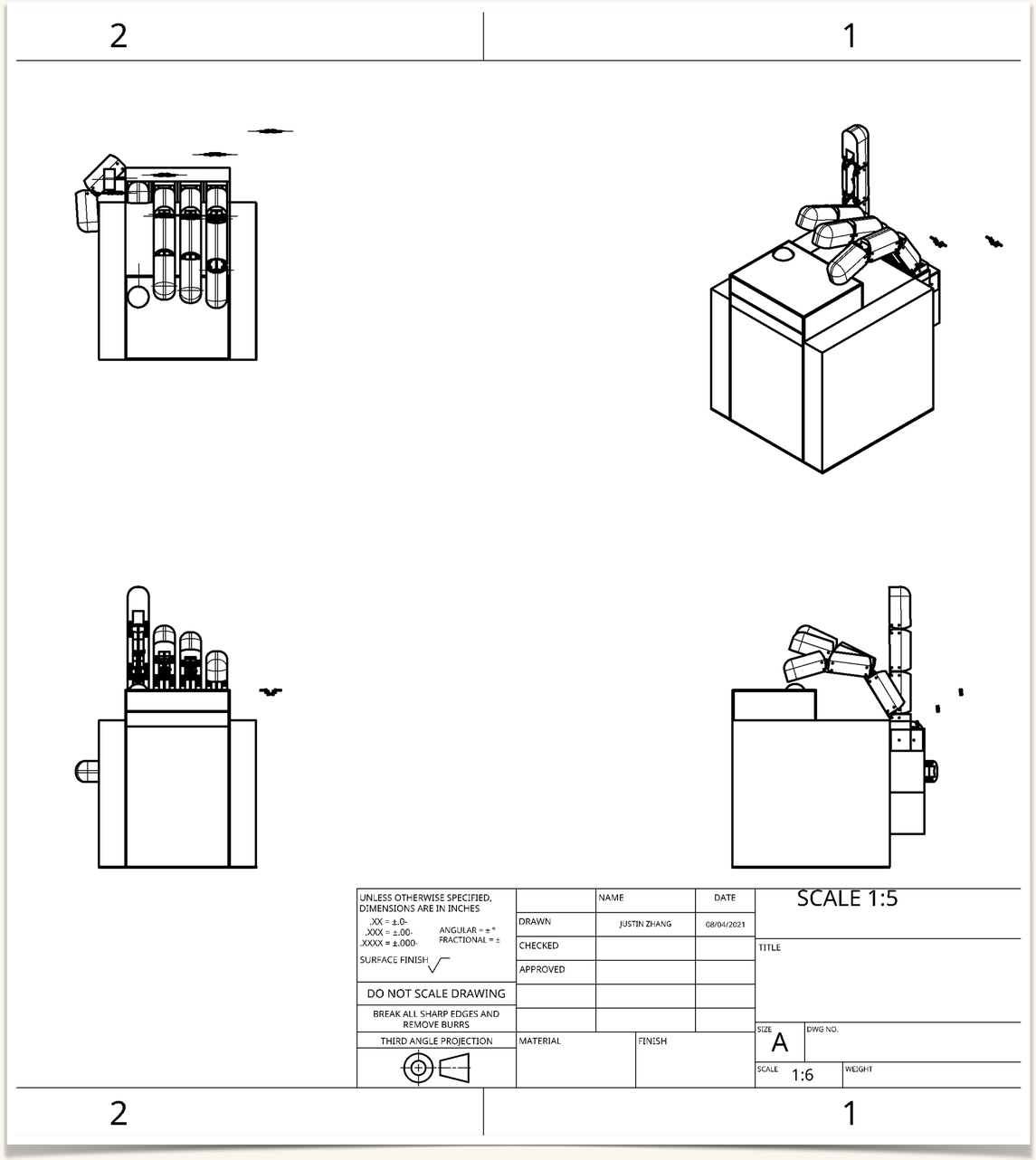
Minyang ZHANG

IAT 309W Portfolio

Whack a Mole

IAT309W Portfolio

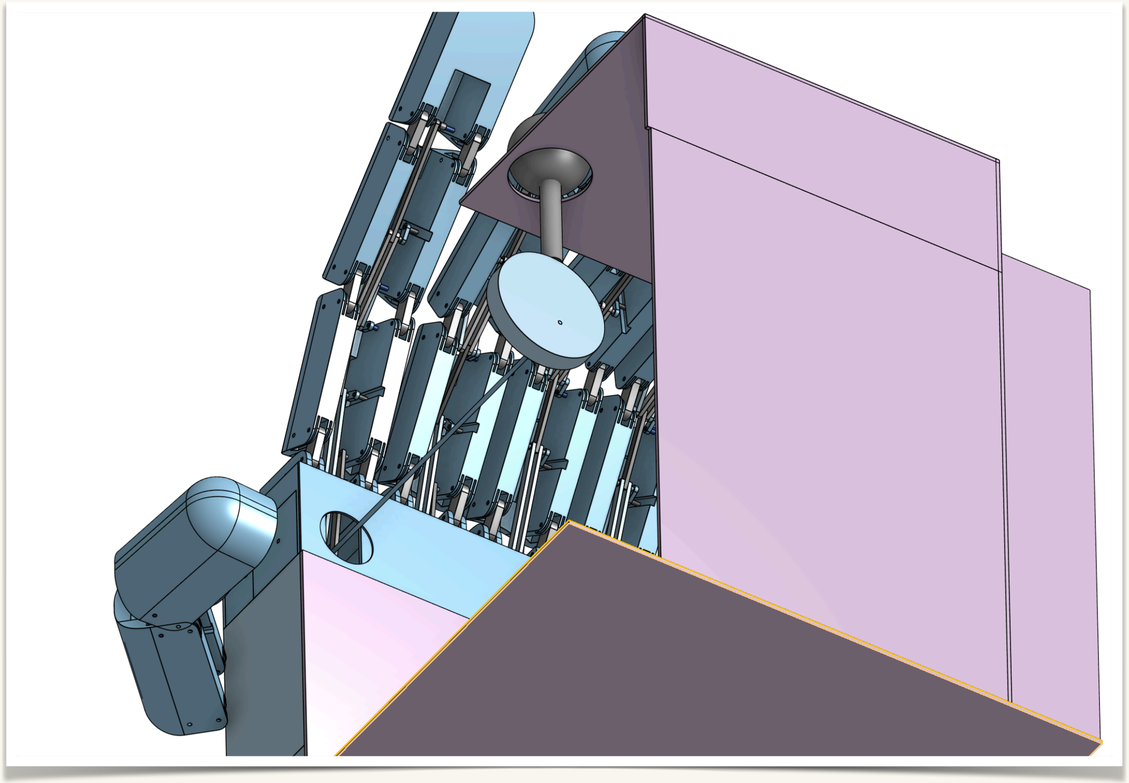
MENU



Bio Statements

- I’m a fourth-year IAT student and Spatial designer.
- I am super interested in spatial design. I like using transmission structures like gears and cranks to build different devices with different functions. I have been a huge fan of precise robots since I was young. Every time when I see a machine driven by several transmission components, I dream to build one on my own, and that dream is finally achieved when I take IAT 106. To create such a device, I used a web called Onshape, for it provides me with a visualized modeling environment.(96 words)

Figure. 1, A screenshot of my design

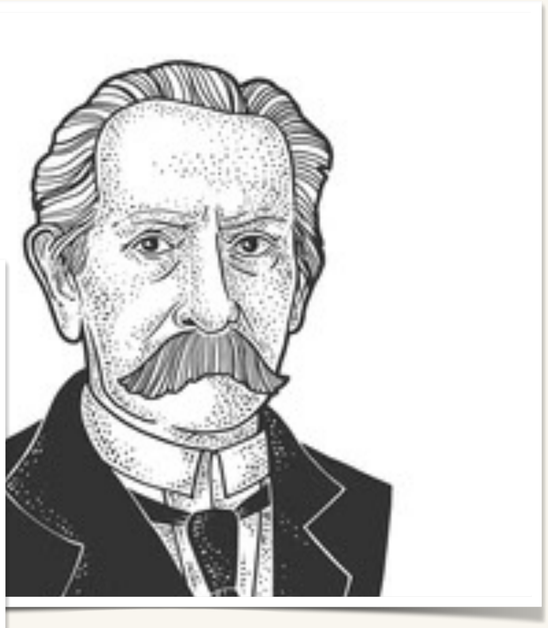


Note: from IAT 106 Project, retrieved in 2022, July 22.

Behavior Interview

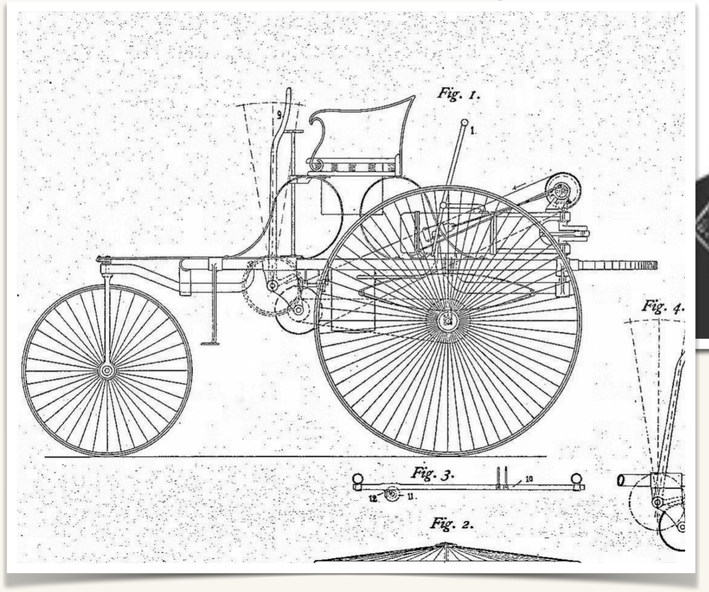
- The person who influenced me the most was the inventor of the automobile, Karl Benz. Inspired by my father, I was fascinated by the structure of cars from an early age. Especially when I saw those components that make up an engine are different in size, but each of them does a job, and when they are put together, they can make the whole machine work despite their different features. Every time when I look at the whole machine, each of the delicate parts of the rotation makes me can not but wonder how beautiful the product of intelligence is. This made me dream that I could design my own transmission structure one day.
- Years later, until I took IAT106, I could finally put the idea into reality. I finally had a chance to start my first design; During the ideation, I read a lot of internal combustion engine design sketches from Karl Benz and other inventors. I tried to understand and simplify the structure of the transmission structure and spun them off from the original design for inspiration. Finally, it helped me design a feasible and more precise transmission structure. (191 words)

Figure. 2, Drawing of Karl Benz

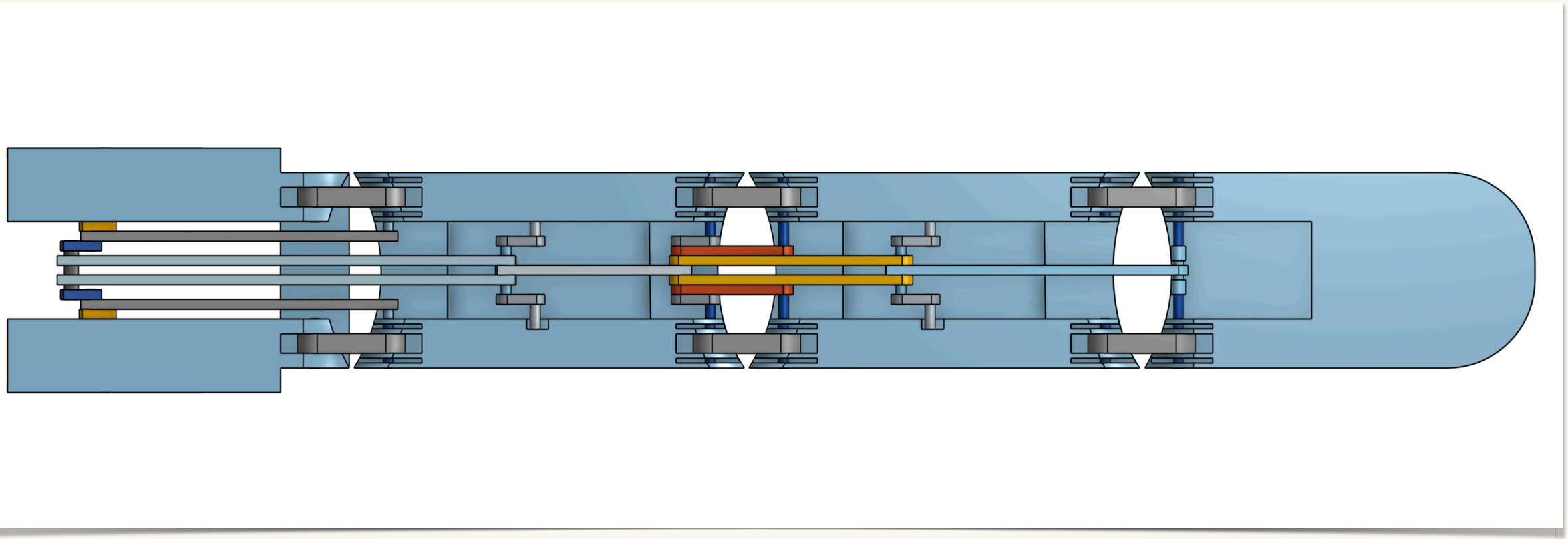


Note: retrieved from 2022, July 22.
https://www.shutterstock.com/zh/image-vector/karl-benz-portrait-sketch-engraving-vector-1725550477

Figure. 3, Sketch of first automobile



Note: retrieved from 2022, July 22.
https://www.hagerty.com/media/automotive-history/freeze-frame-the-drawings-that-showed-us-the-worlds-first-car/



Note: from IAT 106 Project, retrieved in 2022, July 22.

IAT 106 Final Project

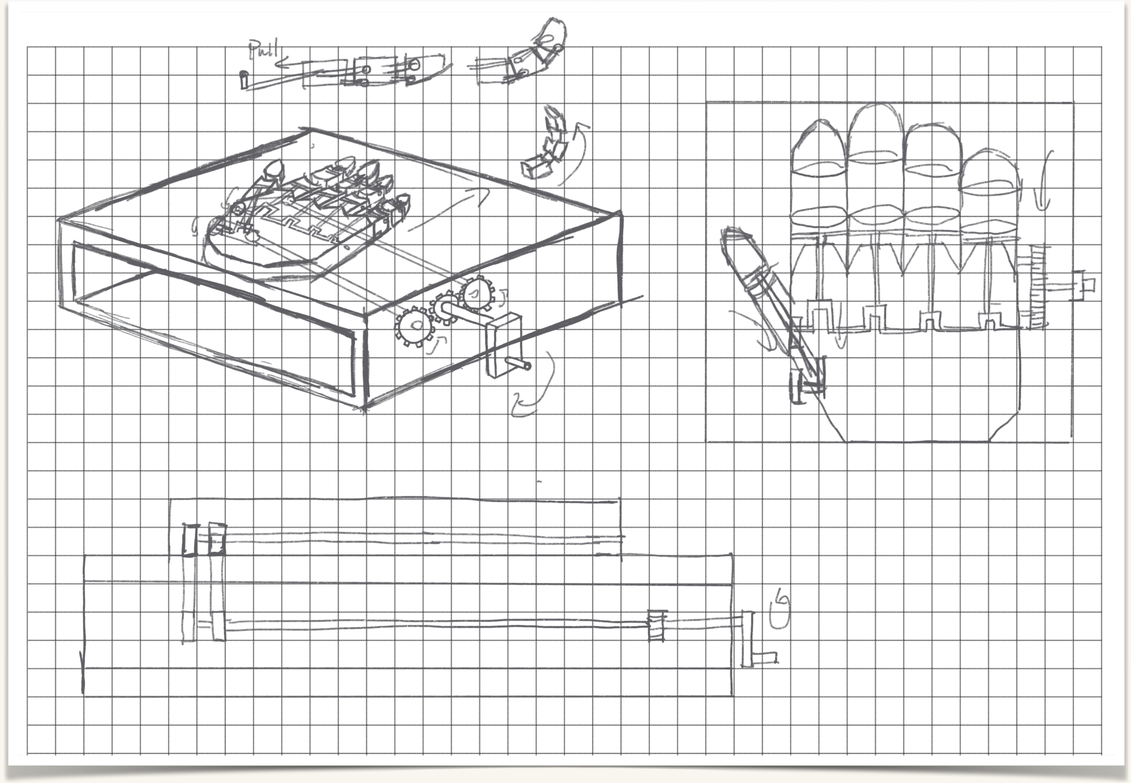
Process Analysis

Whack a Mole

Step - 1 Ideation

- During the ideation period, I decided to design a hand that clenched its fist. This idea was inspired by the movie Iron Man and Terminator since both movies provided a close-up shot when they clenched their fist while checking body status.

Figure. 4, A copy of my first sketch

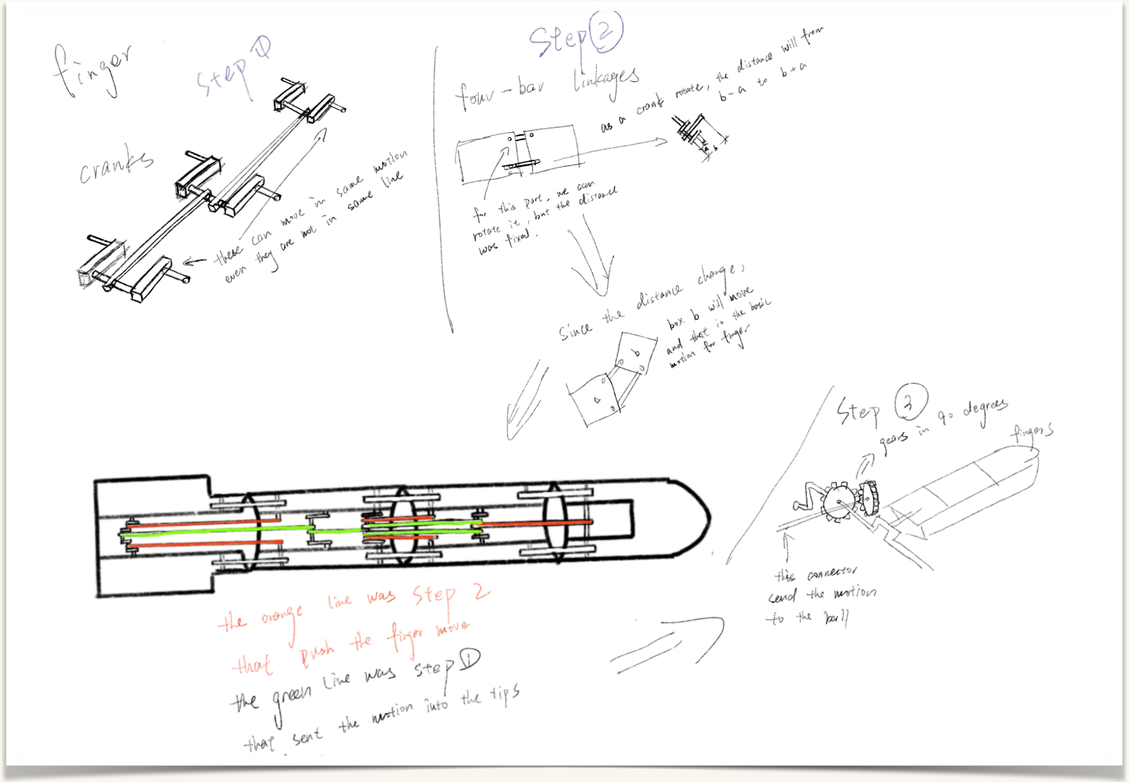


Note: from IAT 106 Project, retrieved in 2022, July 22.

Step - 2 Sketching

- The next step was to develop several plans to make the finger move. This step took me the largest percentage of time since I had to find a perfect balance between the aesthetics of the structure and the possibility of implementation. Finally, I chose to use the crank as the transmission part to drive the finger move.

Figure. 5, A copy of my brainstorm sketch

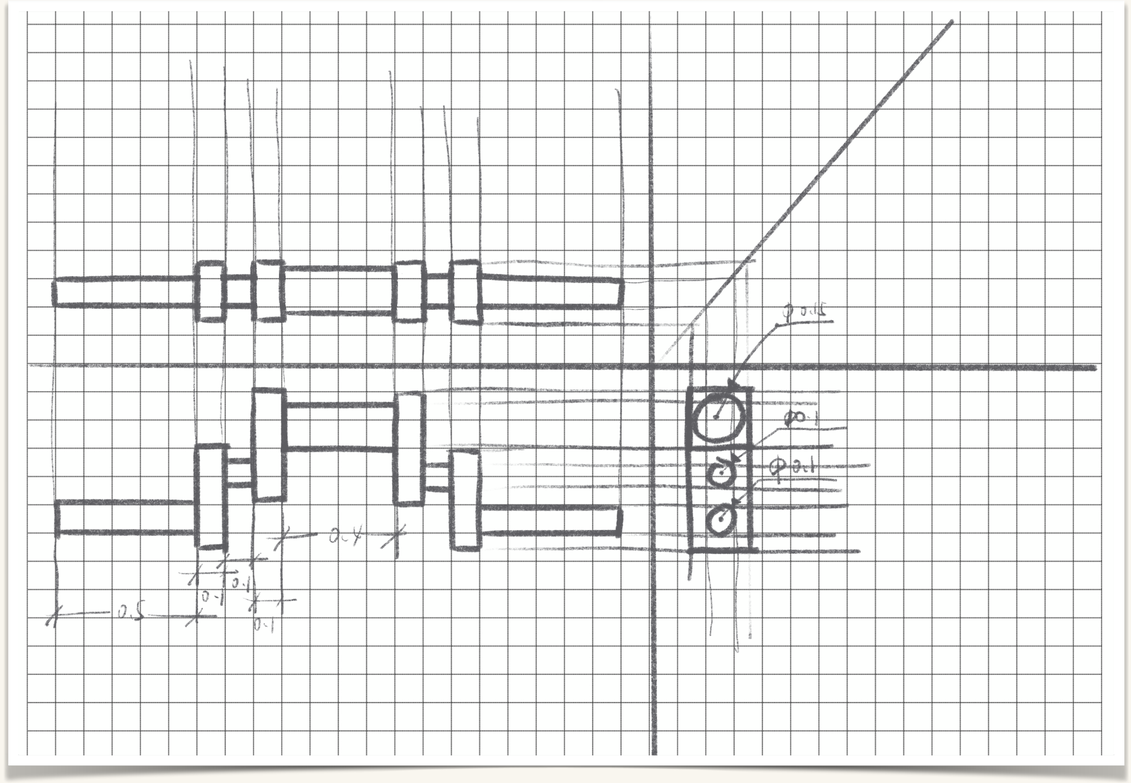


Note: from IAT 106 Project, retrieved in 2022, July 22.

Step - 3 Set Size and ratio

- The next step was to finalize the length and width of each component. The purpose of this step was to make the palm looks more real, and each transmission component inside the device works perfectly. The picture shown on the right side was a crank used in the middle of the finger.

Figure. 6, A copy of the sketch of the detailed component

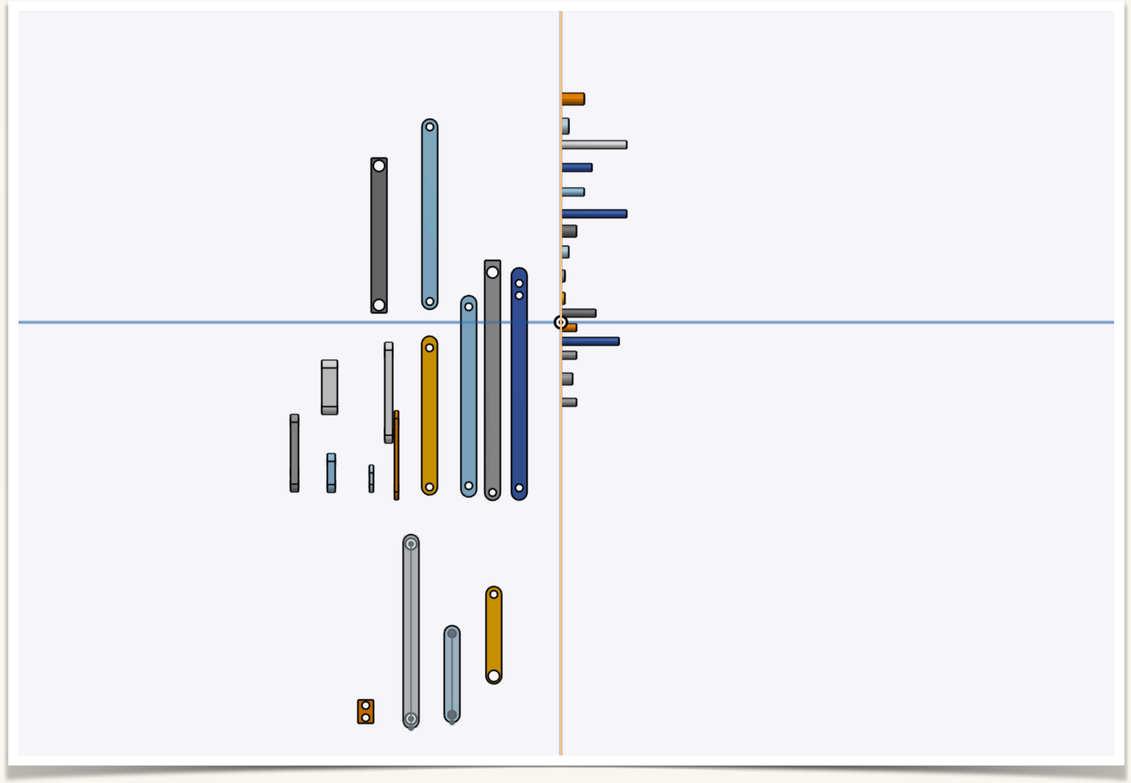


Note: from IAT 106 Project, retrieved in 2022, July 22.

Step - 4 modeling

- After I finished all paperwork, I started to build small components for each transmission component, for instance, cranks. The picture on the right side shows the components of different cranks

Figure. 7, a screenshot of small components of each transmission component

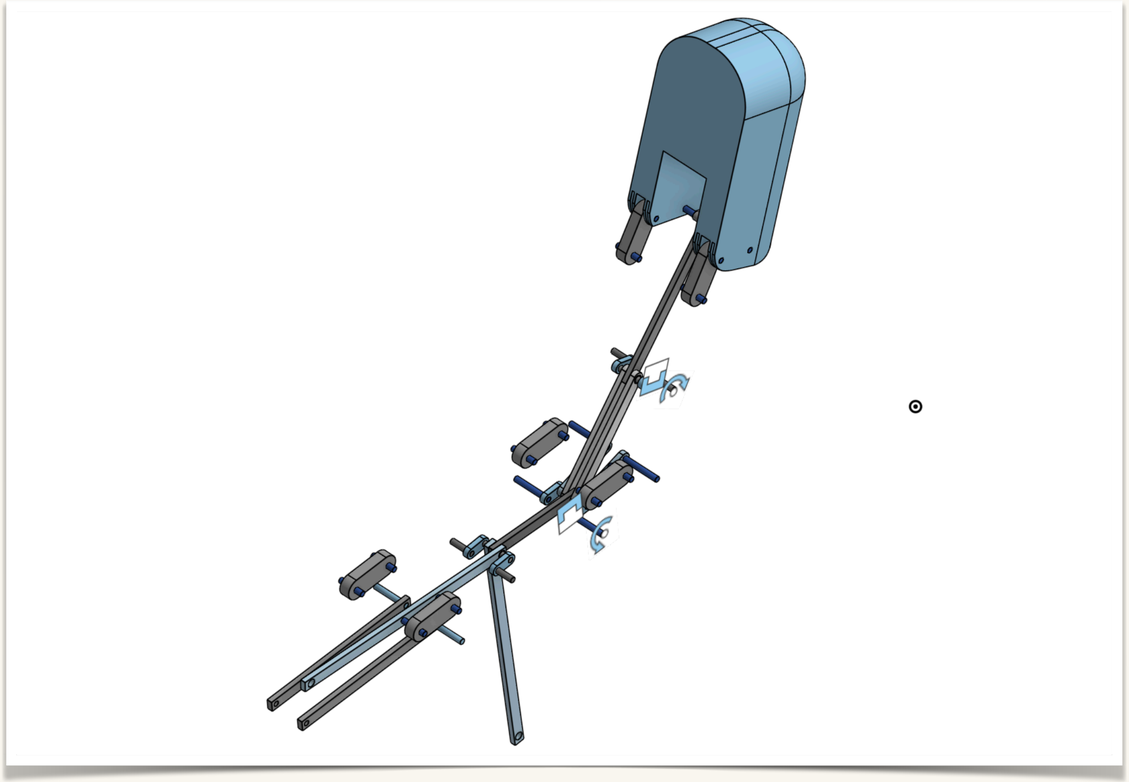


Note: from IAT 106 Project, retrieved in 2022, July 22.

Step - 5 Finger Assembling and Texting

- The purpose of this step was to set all cranks and sticks in predetermined locations and test whether the device works. To do so, I will firstly fix part of the finger and spin the crank to see whether the finger moves as I expected.

Figure. 8, a screenshot of a testing finger model.

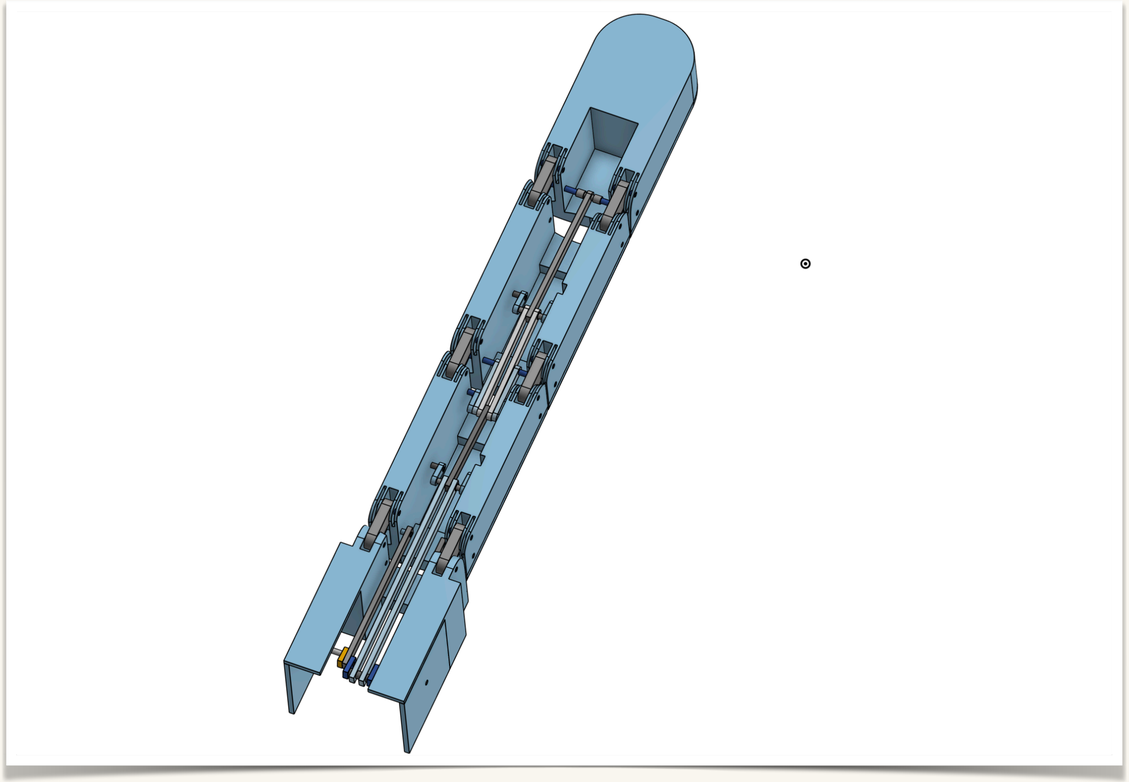


Note: from IAT 106 Project, retrieved in 2022, July 22.

Step - 6 Finger Assembling and Texting

- After I finished modeling one of the fingers, I did not build the rest again and again. Instead, I use the concept of modular so that I do not have to test when I deal with the rest fingers. To do so, I created a base module that can line fingers up. After that, I connect it to each finger. Figure 9 shows an assembly of the base module and finger.

Figure. 9, a screenshot of an assembly of the base module and finger.

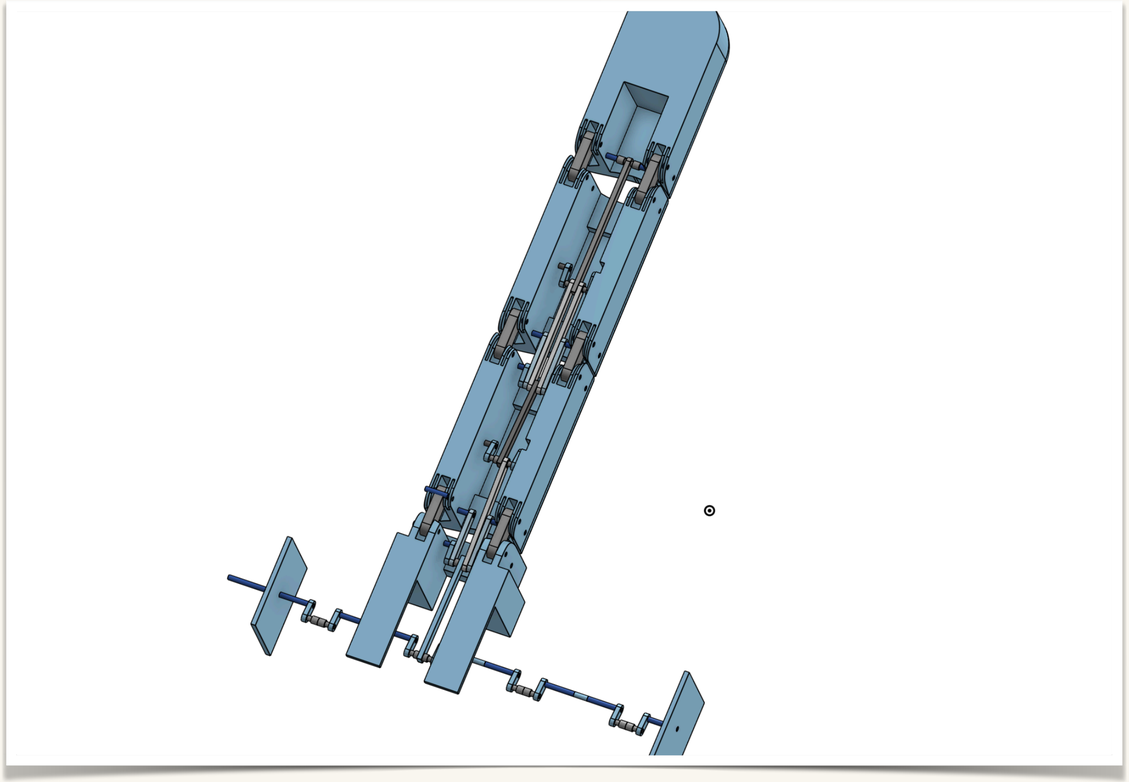


Note: from IAT 106 Project, retrieved in 2022, July 22.

Step - 7 Finger Assembling and Texting

- This step was to connect fingers and make them in series so that they could move together. This step was not hard to achieve but a milestone in my entire project. Since then, the basic function of my design has been completed. All I needed to do next was to decorate the device

Figure. 10, a screenshot of an assembly of the base module and finger.

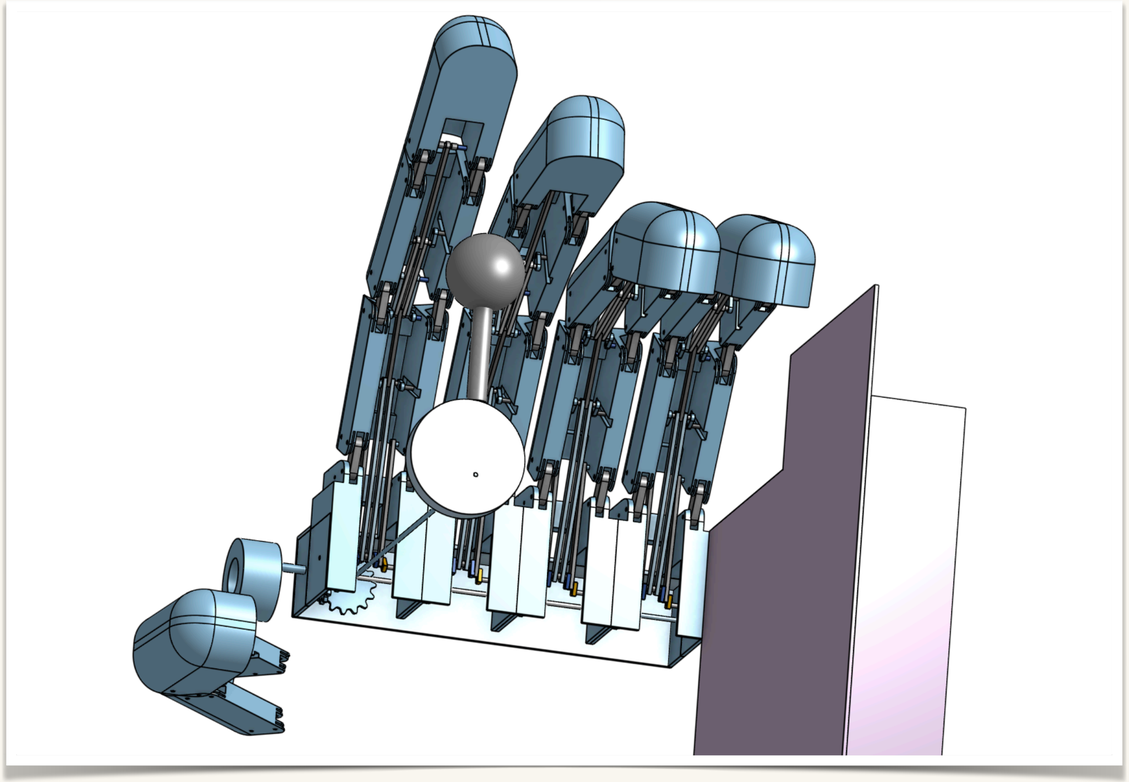


Note: from IAT 106 Project, retrieved in 2022, July 22.

Step - 8 Final product and testing

- Finally, I added some decorations to both the box under the palm and the stick that drive the finger to move. (379 words)

Figure. 11, a screenshot of an assembly of the base module and finger.



Note: from IAT 106 Project, retrieved in 2022, July 22.

Exit Reflection

- One of the most important things I learned from this course is the way to communicate. As the well-known scholar Mike Sharples mentioned in his book *Messages in Bottles*, the first Sharple's design principle most evident in my portfolio is "It takes two to make a dialogue"(Sharples. M, 1999). In other words, good communication relies on both author's and the reader's effort. In this portfolio, I applied this principle by showing the key process to make the portfolio more logical. This could best help the reader to follow my ideation process. In this portfolio, starting from page 5, I spend 8 pages explaining how I make that transmission component into my final design. Those pages and listed in the time sequence. The second principle provided by Sharple was that "Ideology also influences the way we act, and believe other people ought to act, as writers."(Sharples. M, 1999) in this principle, he argues that our mind will strongly affect the way we describe a case or an object. In this case, my IAT 106 final project was not simply about transmission devices, it also contained many other ideas and knowledge. However, since I am interested in this area, my portfolio mainly focused on explaining how I deal with transmission devices. This theory can be found on page 4. In this page, I explained I would share my project in the aspect of transmission device view because I am super interested in this topic. The largest thing I learned from Sharples' principle is how to communicate with the audience even if they are not in front of me. (269 words)

Reference

Source:
Sharples, M. (1999). ‘Messages in Bottles and Cultures.’ Chapter 10 in *How We Write: Writing as Creative Design*. Routledge: New York. Pages 153-167. Available online via SFU library: https://ebookcentral.proquest.com/lib/sfu-ebooks/detail.action?pq-origsite=primo&docID=166989

Image:
Karl Benz Portrait Sketch engraving vector 1725550477. Shutterstock. (n.d.). Retrieved August 3, 2022, from https://www.shutterstock.com/zh/image-vector/karl-benz-portrait-sketch-engraving-vector-1725550477

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