

Maki's Development

Michael West

in collaboration with Kate Tsui

Goal:

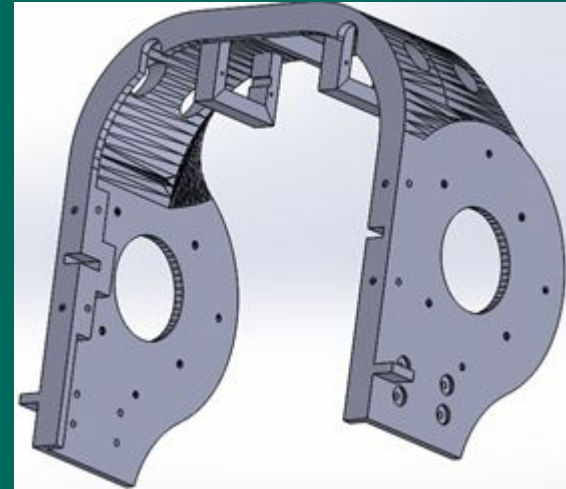
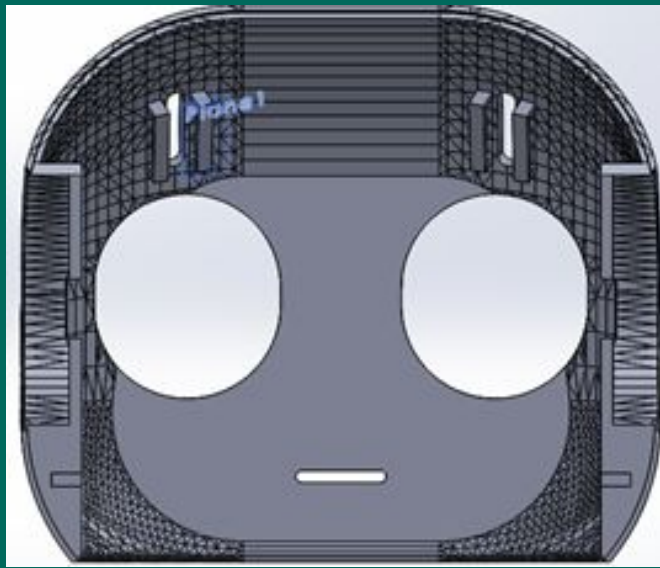
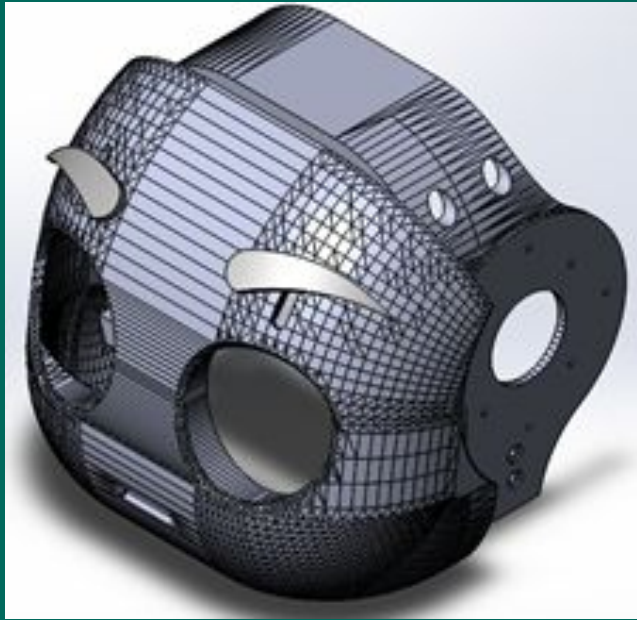
Provide Maki with
eyebrows that move up and
down.

Solidworks



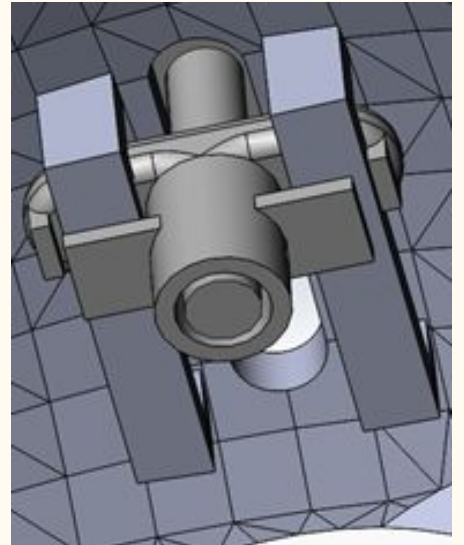
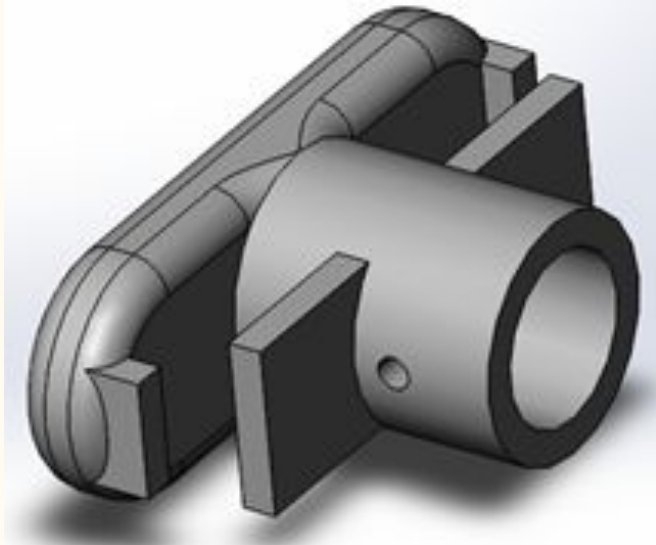
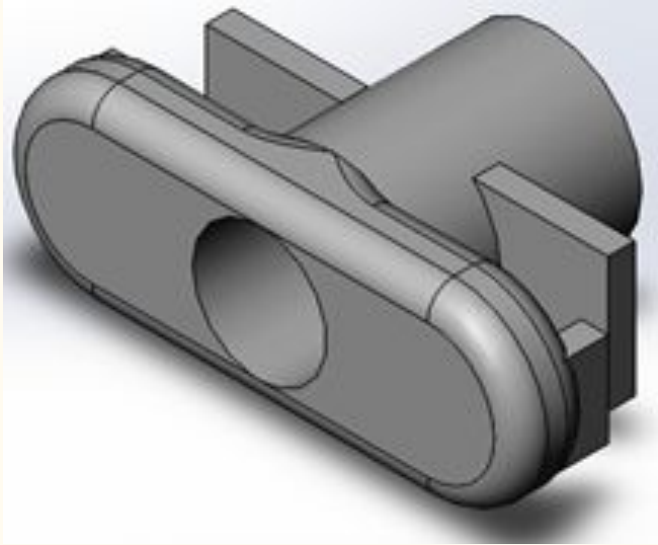
Preliminary design

1. Face + eyebrows



Preliminary Design

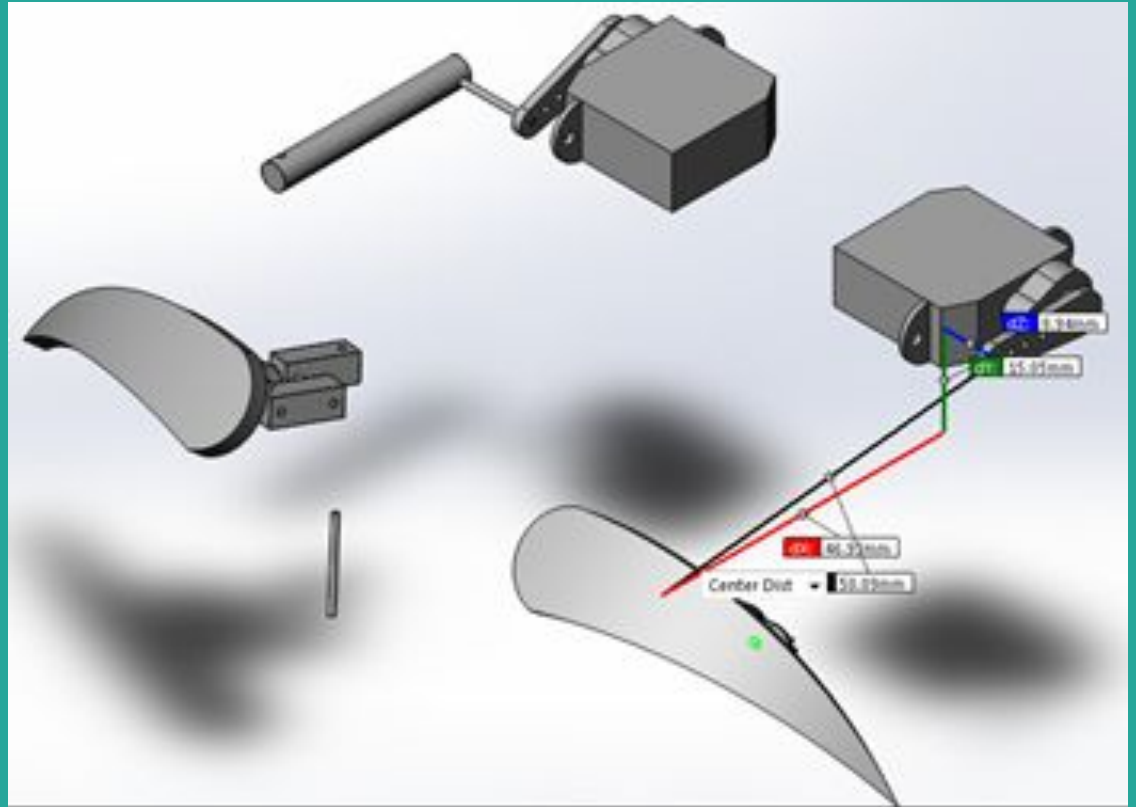
2. Eyebrow Holders



1st Challenge

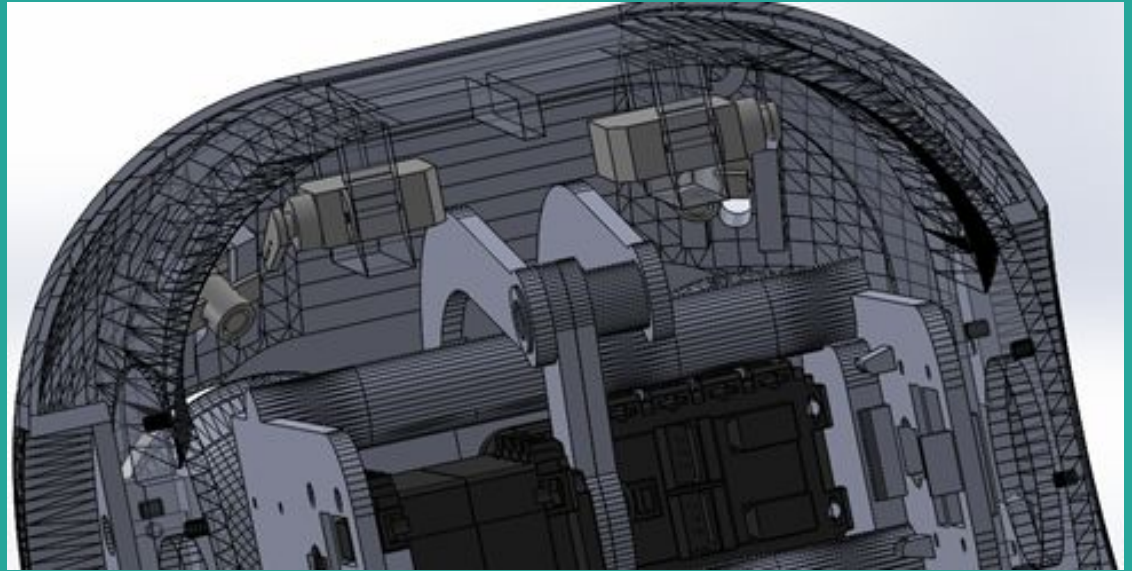
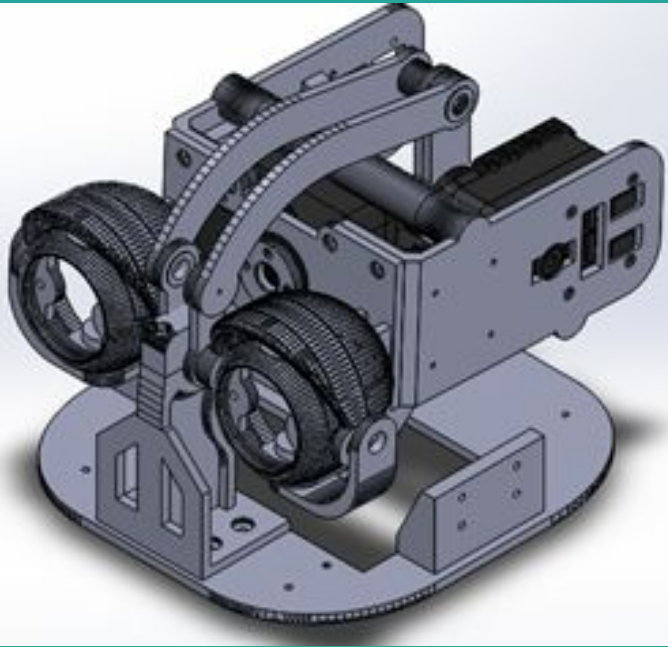
We needed some sort of rod or actuator to connect the servo horn to the eyebrow holder.

This rod must account for the non-linear path between the servo horn and eyebrow holder, and this rod must create allow the servos smooth motion to account for the smooth curve in Maki's head.



2nd Challenge

Must be able to navigate all the other internal components of Maki's head



Secondary Design (Spring Pulley System)



Secondary Design (Changes)

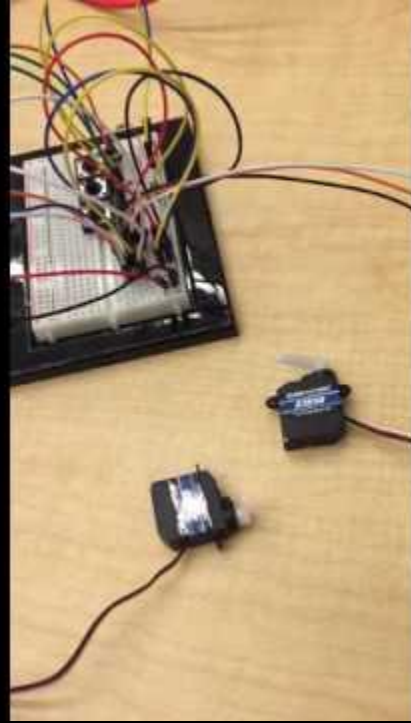
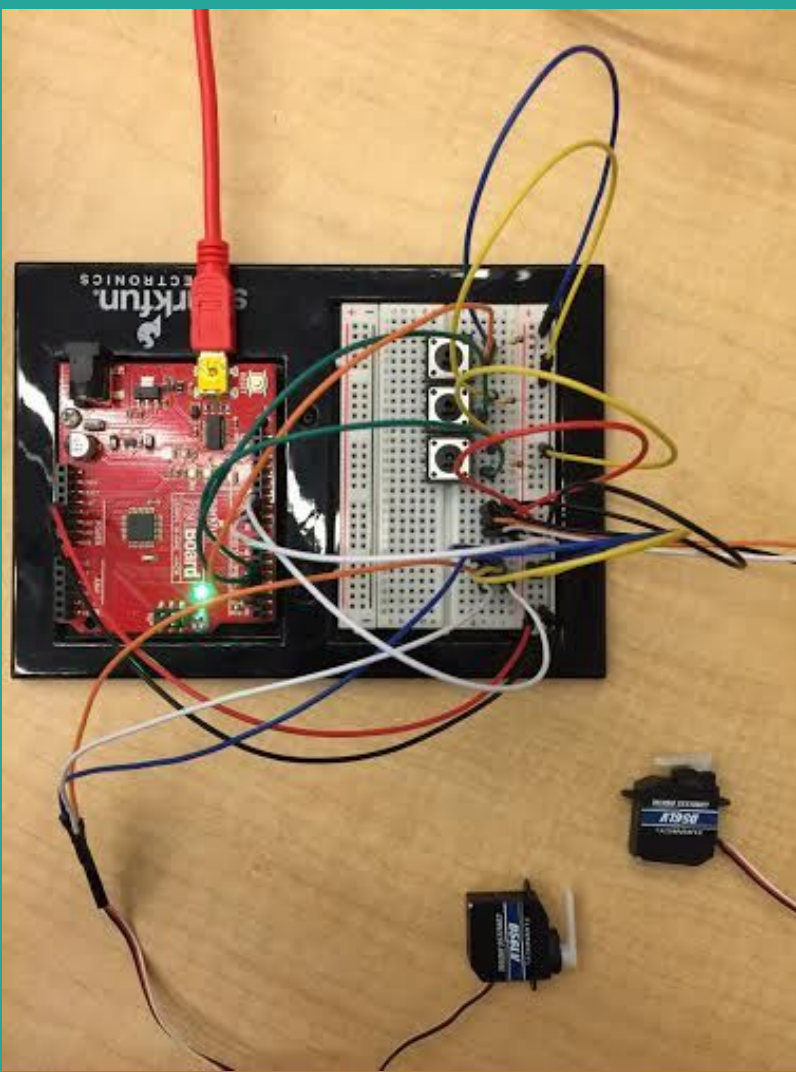
In the initial calculations for torque we neglected to account for friction.

Also neglected to account for the tension caused by the stiffness in the bicycle wire.

Led us to change to the material of the wire and reduce the spring constant in the spring.

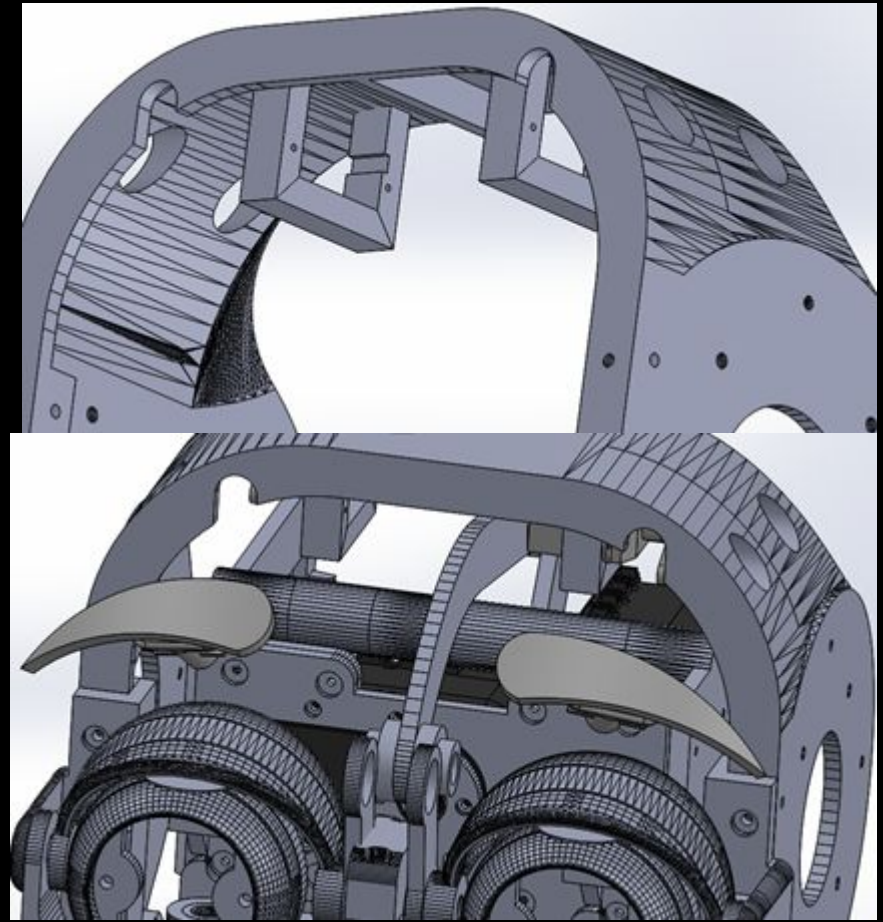
Arduino





What's Next

- Adjustments to headband
- New coupler
- Adjustments to eyebrows



What I learned

The first 80% of a design is the easy part working out the rest of the kinks is where you spend most of your time.

- Featureworks
- Arduino