



forge

- Showcase Fall 2021 -

Team 2



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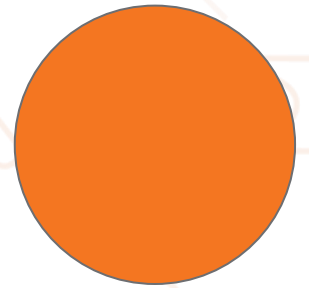
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Problem Identification

Individuals with Arthritis have difficulty typing effectively and efficiently on keyboards. It requires fine motor skill of the hands and individual fingers to type and this needs to be overcome for individuals where typing is challenging.

Target Market and Opportunity

Individuals with Arthritis need a new approach to typing

In the United States 24 percent of adults have some form of arthritis and it is the leading cause of work disability

More than half of US adults with arthritis (57.3%) are working and over 8 million adults report difficulty working

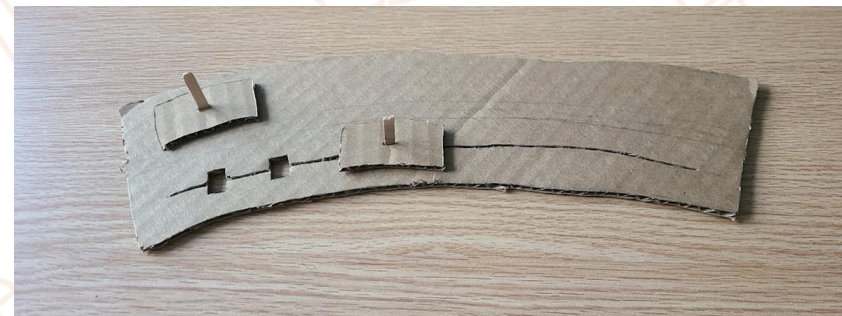
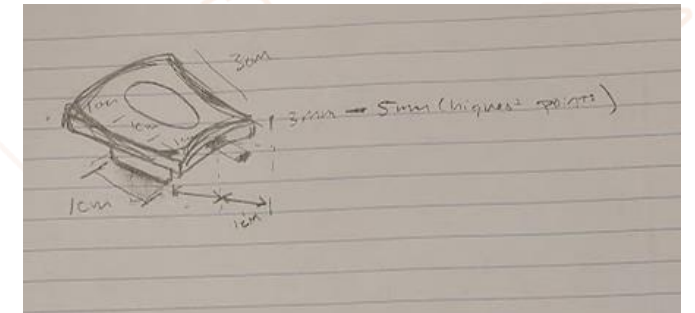
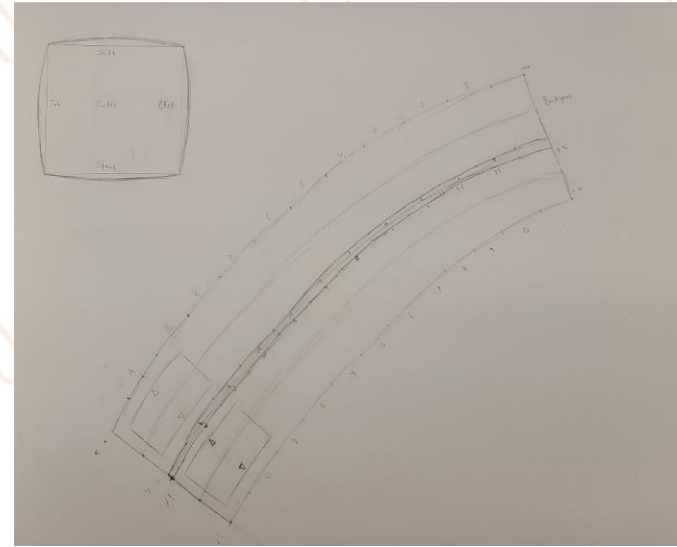
Typing poses a specific problem for individuals in their professions due to fine motor movements which are challenging

Ideation

Created possible solutions guided by thinking about affordances (swipe, tap, etc)

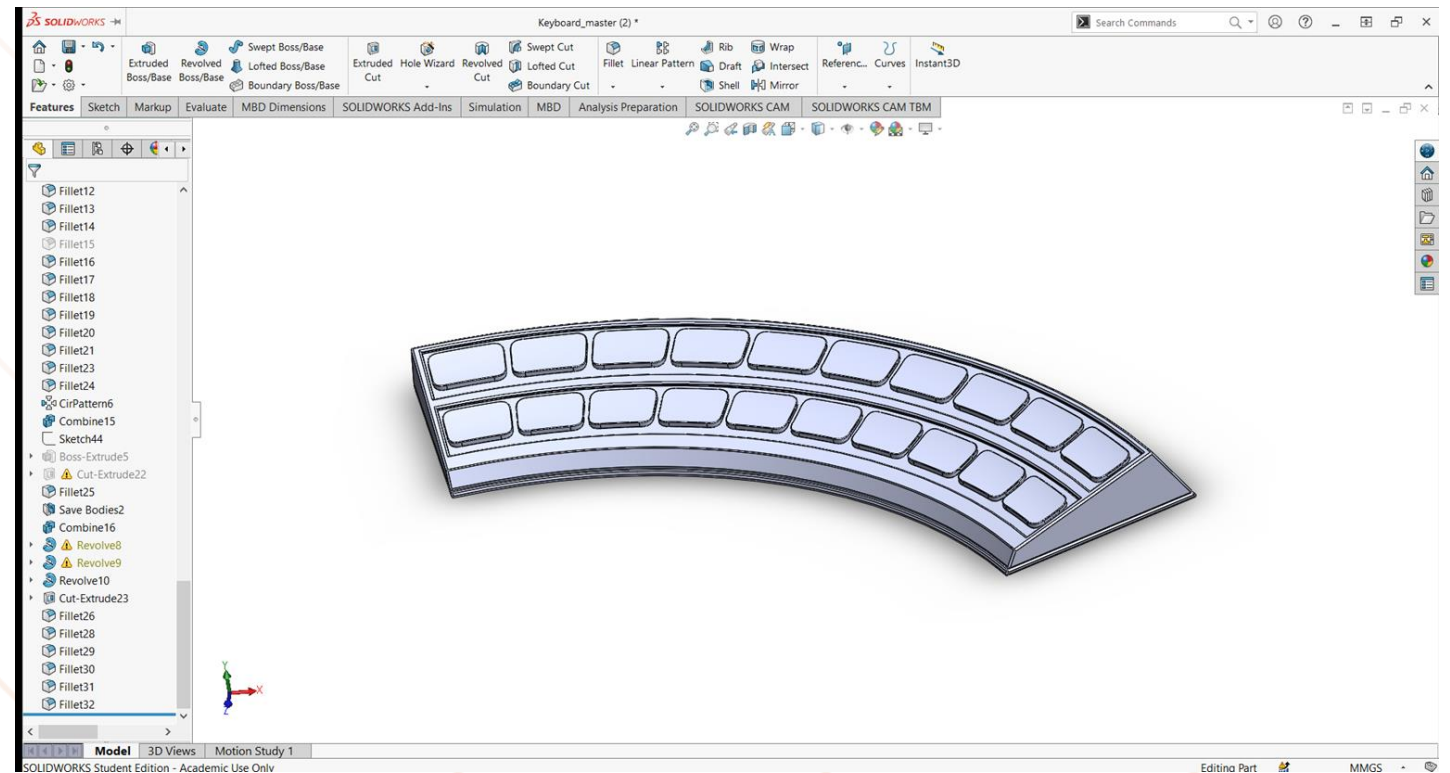
Looked to create a keyboard that does not use fine motor movements and does not require tiring stress on an individual's hands

Settled on a final arc shaped keyboard that relied on a sweeping movement of the forearm and a pushing of the keys forward and back instead of down



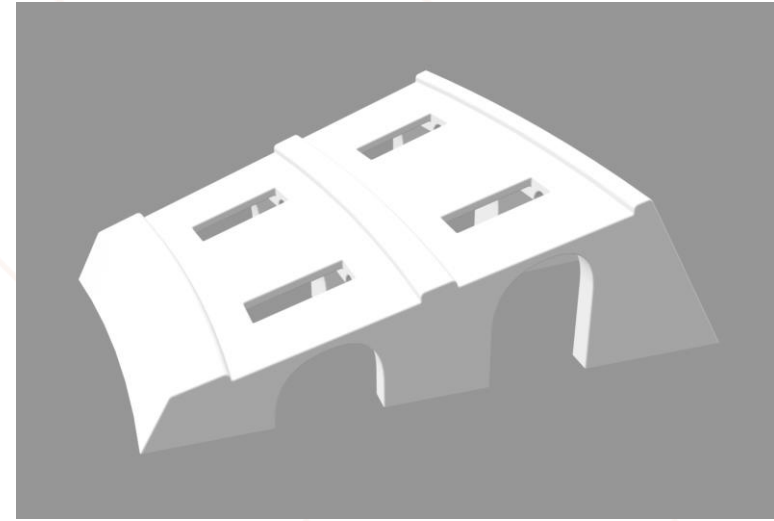
Product Overview

The product is a keyboard that reduces the need for fine motor movements by creating bigger keys that are pushed forward and back, which is a more conducive movement to those with arthritis. Letters or numbers are selected with the push and pull motion rather than a traditional keyboard with small keys that push straight down.

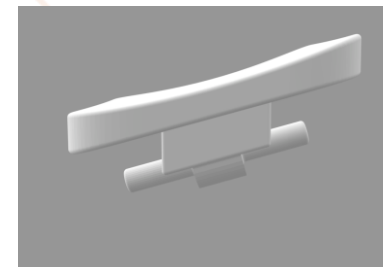
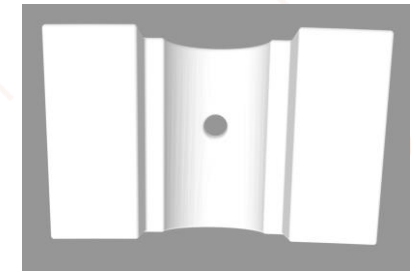


Technical Development: CAD

The base of the keyboard was created at a slight upwards slant to create a more ergonomic position

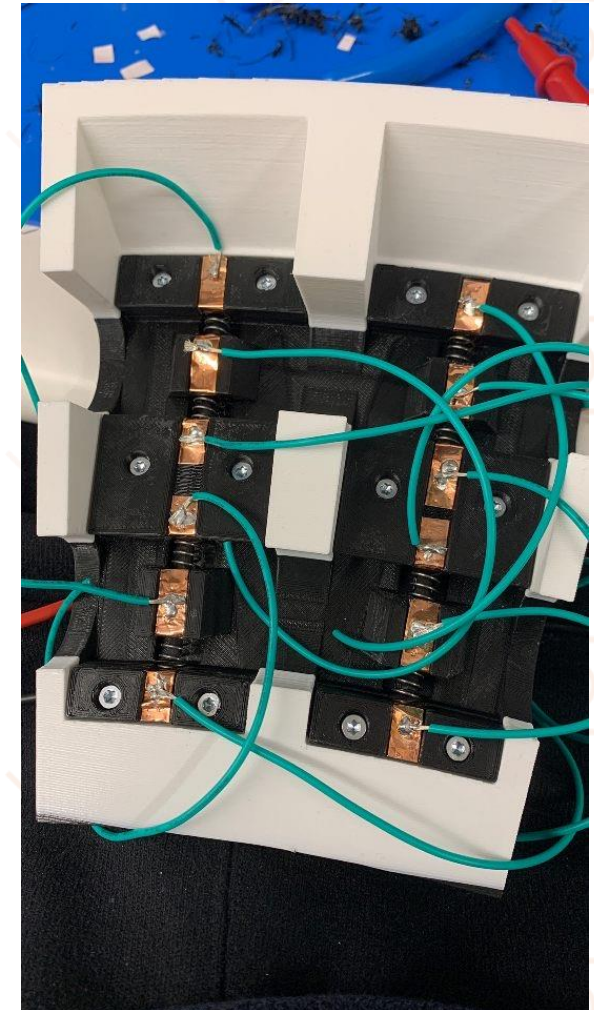
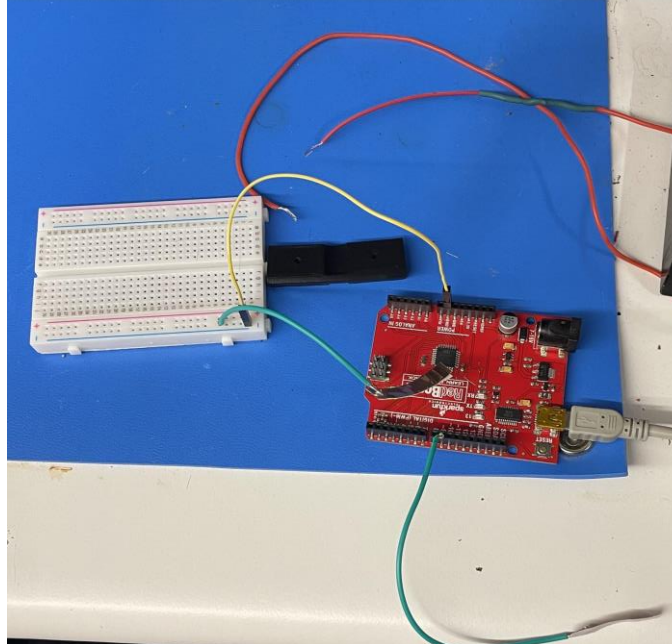


The keys were created in two pieces: the top and the bottom pieces which will be eventually assembled together with springs in the base



Technical Development: Electrical

Arduino was used along with copper tape and wires to create the connections needed on each side of the keys in order to select different letters



Product Next Steps/Go To Market

Product Next steps

Create a full-sized keyboard to test range of motion, functionality, and efficiency of the curved design and size of the keyboard

Test the height of the keyboard base for the optimal angle

Create keys that are more assistive

Implement diodes to prevent keybinding

Marketing

Market the device to working individuals with arthritis who primarily use computers in their everyday lives

Utilize social media and platforms to advertise the benefits of the device

Work alongside a technology company to gain a broader audience and share more information

Project Reflection

Challenges

Creating a design that required little to no fine motor skills

Designing the 3D keyboard with an arc as well as an angle to the base

Finding a method to return the springs back to their neutral position

Successes

Lots of teamwork during the ideation process, many ideas and contributions, sketches, and rapid prototypes

Design of the 3D keys of the board the allowed for multiple fingers to rest on one and to reduce fine motor movements

Using copper tape and solving the electrical component of the keyboard