

Synapse

by Behnaz Farahi



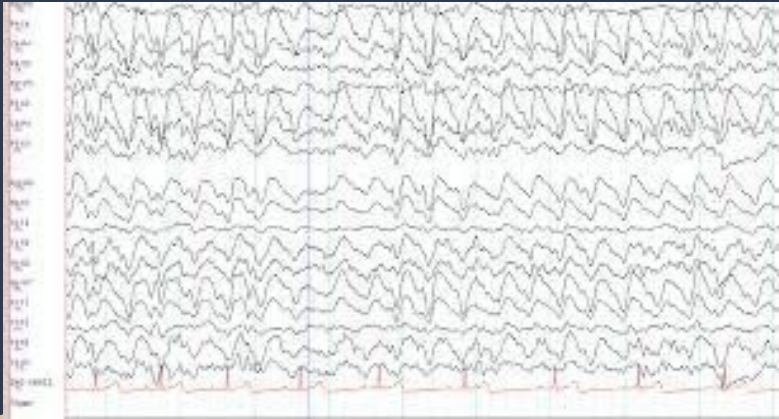
By Anshul Patil

What is Synapse?



- a multi-material 3D-printed wearable piece
- it moves and changes shape in response to the activities of the brain
- the design lives somewhere between eyewear and wearable technology

What is the main function?

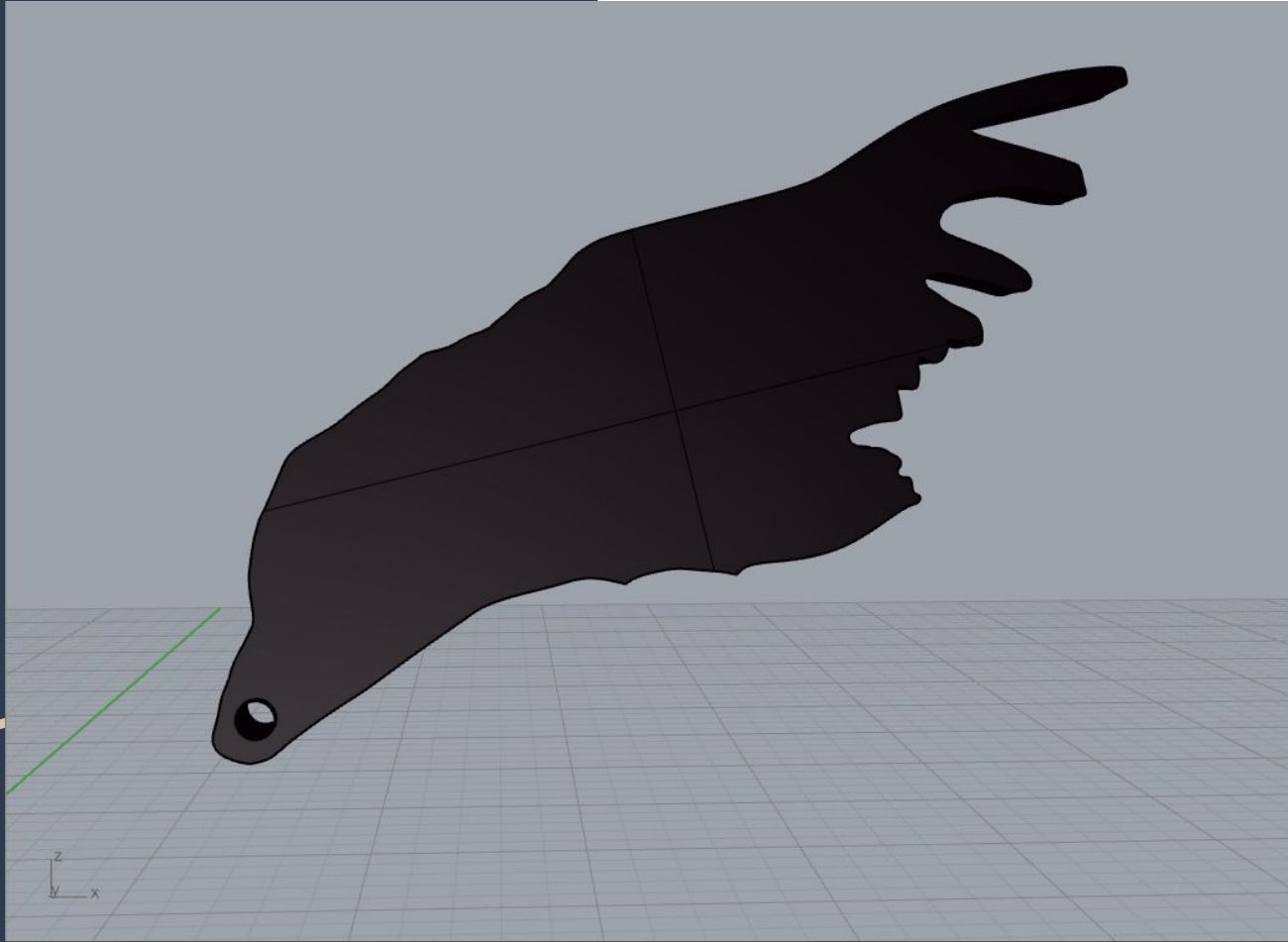


- the main intention of this project is to explore the possibilities of multi-material 3D printing in order to produce a shape-changing structure around the body as a second skin
- when it reads the frequencies of certain brain waves during attentive and meditative states, it expands the Synapse cap to either contract or expands (which will cover one's eyes)

Contracted



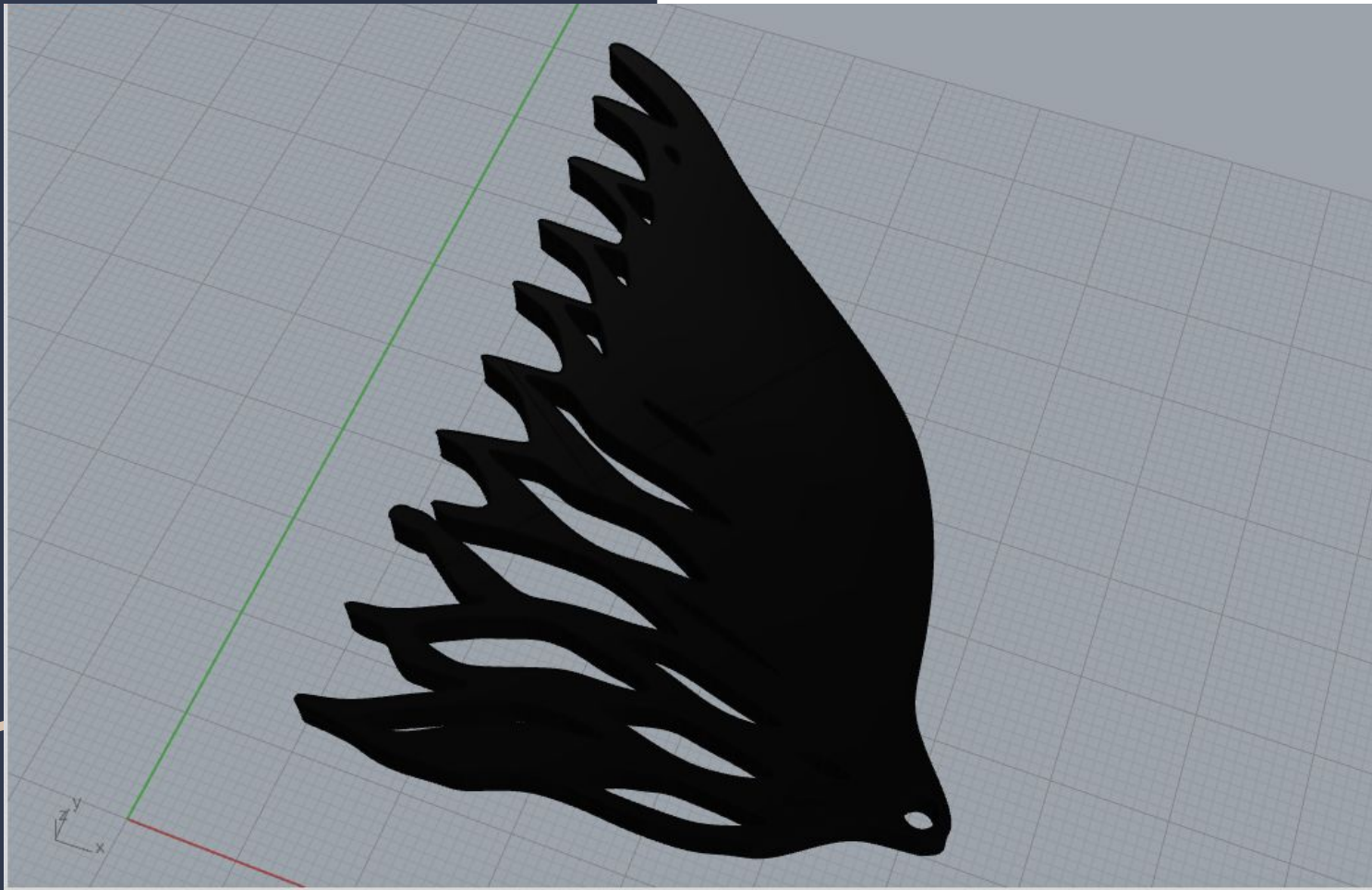
Contracted



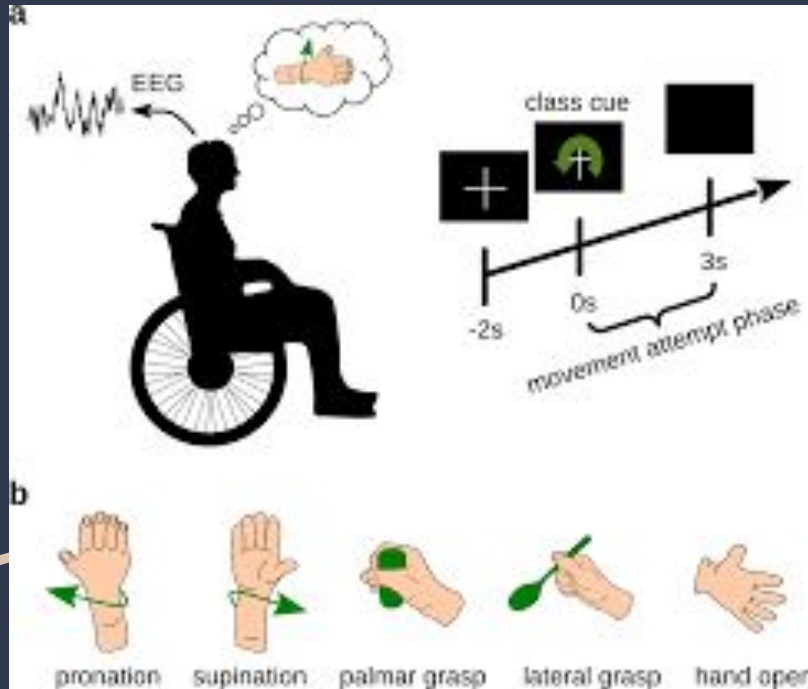
Expanded



Expanded



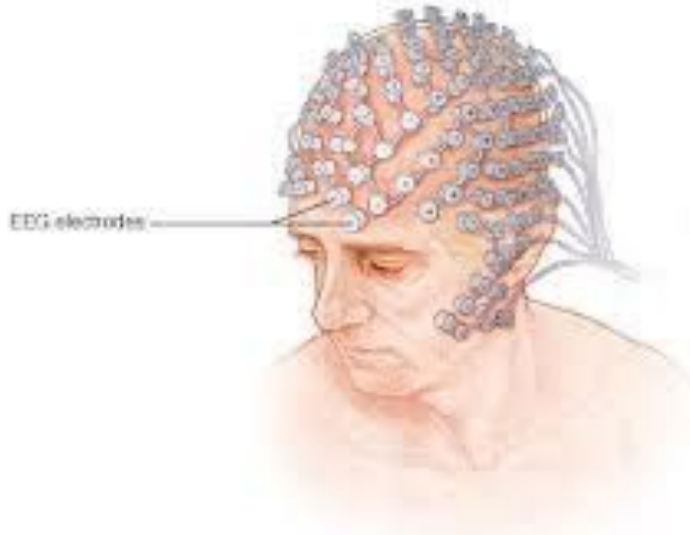
What is the purpose?



- the project seeks to explore direct control of the movement with neural commands from the brain so that we can effectively control the environment around us through our thoughts
- this project is working to set up future research on the topic of control movement through neural commands

Project Feature

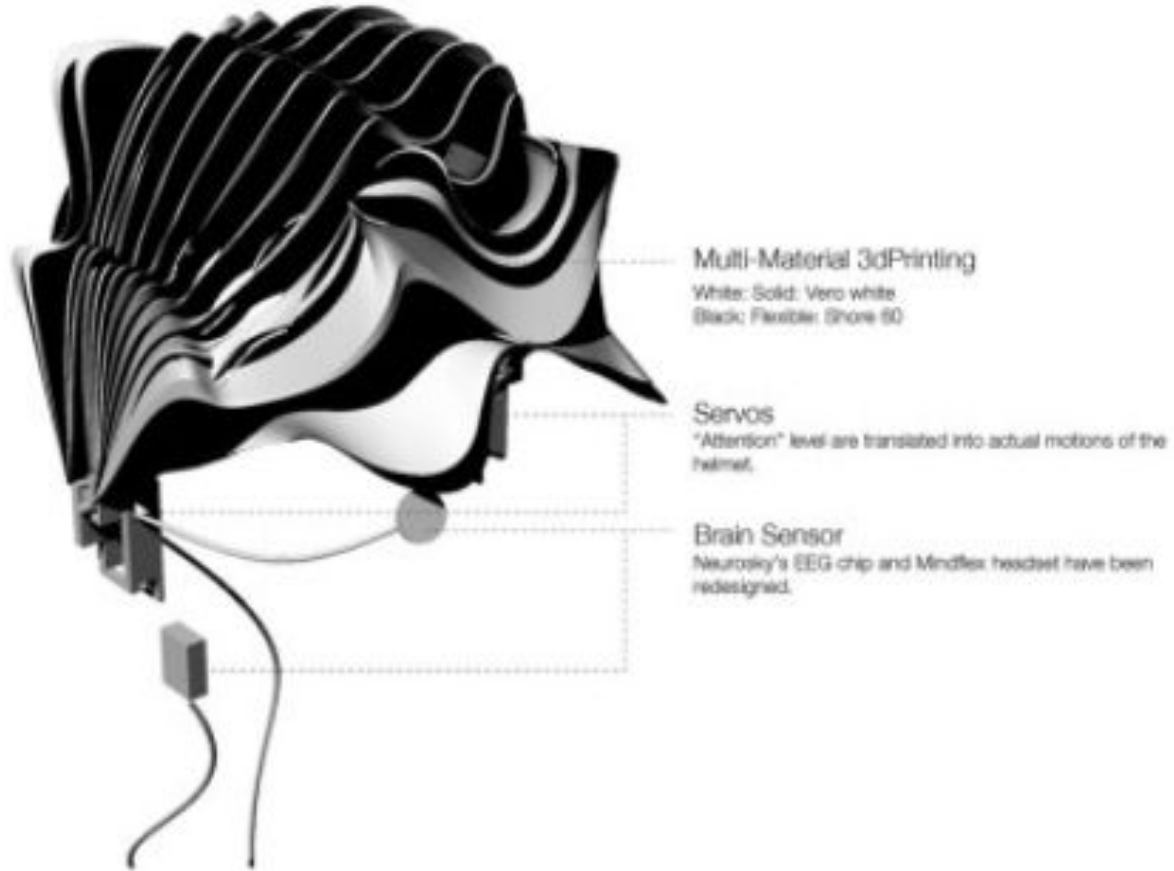
- uses EEG (electroencephalography), neural activity from the brain, in order to make the corresponding movement
- this aspect of the project is unique because robotics along with brain waves is a very new and complex idea
- This feature shows how EEG can be used for several other things as well and opens up endless possibilities as far as neural activity from the brain



Example at work



General Design



General Design

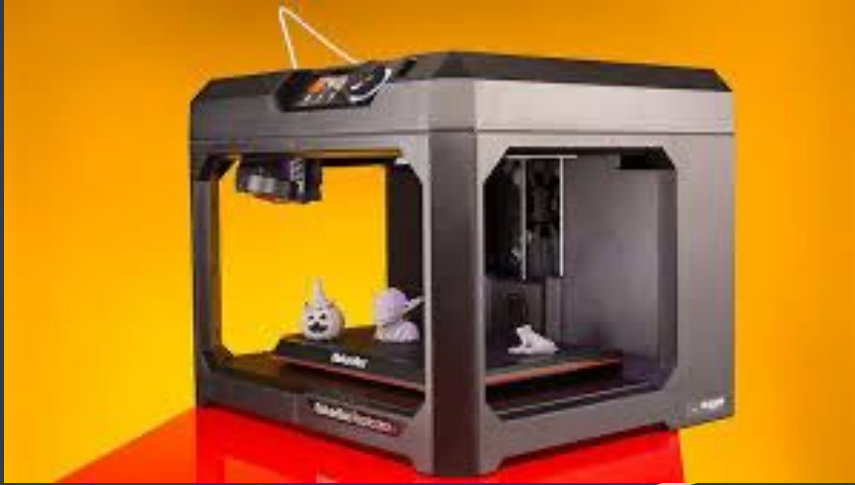


Servos - they help expand and contract the helmet by using its series of motors to do so



Brain Sensor - this picks up the brain waves using the EEG chip and recognizes the frequency that is being emitted. These waves are referenced in the software and will tell the servos whether it should expand or contract.

Materials



- Made from soft materials through the process of 3D printing which gives it the ability to contract and expand (first multi material 3D printer)
- A prime example of soft robotics as it has a mechanism which lets it expand and contract only one way

Improvements



- give the device a better look and structure because it looks very unnatural
- create more helpful movements rather than covering one's face(ex. moving and artificial limb)

Challenges With Case Study

- Tedious getting specific information such as the material used to build the device and the process in which they conducted research
- Not a lot of information given
- Very few sources to choose from when researching
- Hard to add some textures in Rhino

Sources

https://www.vice.com/en_uk/article/53w9wn/brainwaves-morph-this-wearable-headpiece-like-an-alien-face-mask

<http://behnazfarahi.com/synapse/>

<http://behnazfarahi.com/exhibitions/>

Thank you for
listening!



Any Questions?