Tactile Cube Project

Mechanical Design

In terms of how the cube is fit together I do not have too much explanation. 4 sides of the cube fit together onto the main skeleton, only the front plate (the one with the USB) and the backplate are custom in a sense they interlock into each other.

Diagram

Description automatically generated

Figure Basic cube assembly visualisation

I am sorry, I am not the best 3D designer in the world, and I have no knowledge of design standards. The environment used was Fusion360. This is one of the best designer software for basic 3D shapes and the Tools/Solid/3D print exports 3D files that can be used by slicer software.

# Non – 3D printed components used:

* Silicone – “SORTA – Clear – 12” – translucent soft silicone - <https://www.benam.co.uk/products/silicone/addition/sorta-clear/sorta-clear-12>
* Neodymium magnets – 2mm dia \* 1mm thick – N42 <https://www.amazon.co.uk/gp/product/B007JTKHR6/ref=ppx_yo_dt_b_asin_title_o00_s00?ie=UTF8&psc=1>

# Changes in the design during assembly:

The internal shelves with the number of cables in the cube did not fit, so I have cut off the 2 battery holders, and instead just used tape to keep the batteries in place.

# Improvements to make:

The current design is not easy to assemble, this shelf-based system does work but cable management is difficult, and mostly relies on tucking the wires away during assembly. If the shelves and the main skeleton could be merged in design, it might become simpler and more modular.

Shape

Description automatically generated with medium confidenceShape

Description automatically generatedThe silicone moulds must be redesigned with lids and ability to put pressure to get rid of the extra silicone to guarantee consistent width.

Figure Silicone moulds currently

The button system could be improved upon, the tolerances right now are very off, and the buttons can flip out of their places.

This might be pointless, but on the cube edges some ventilation holes could be designed, with some of these vents being used for the programming cable, USB connections, charging LEDs and anything else that might be needed. I’d imagine a shape like on the shape on the right.