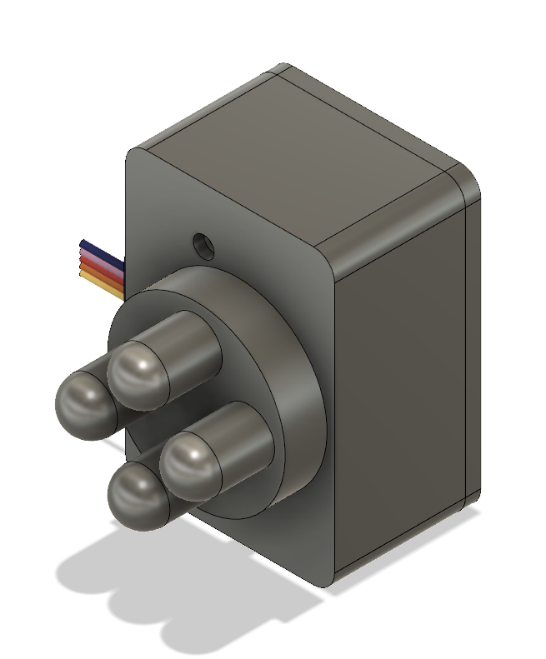
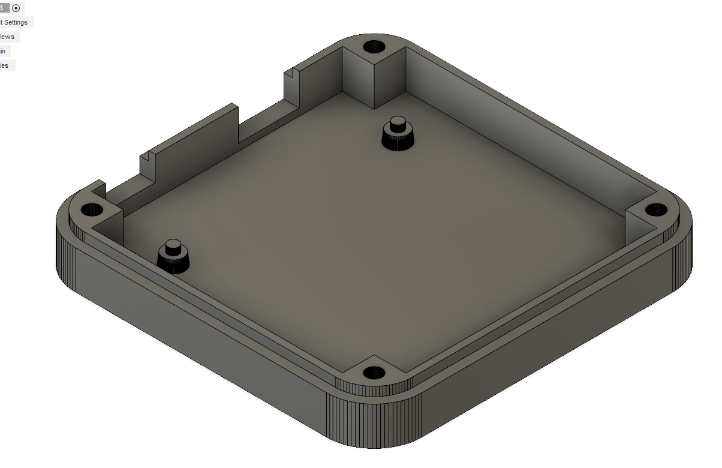
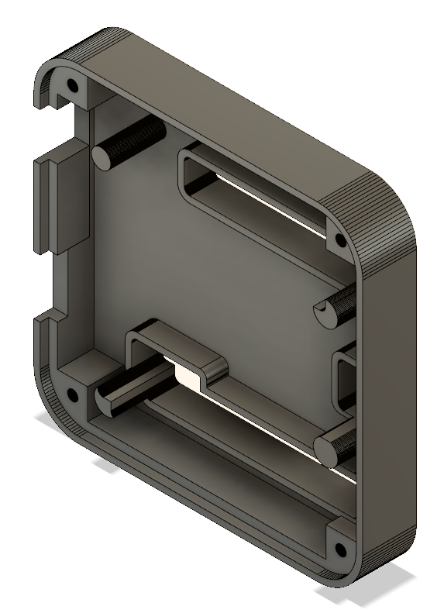
**Sprint 2**

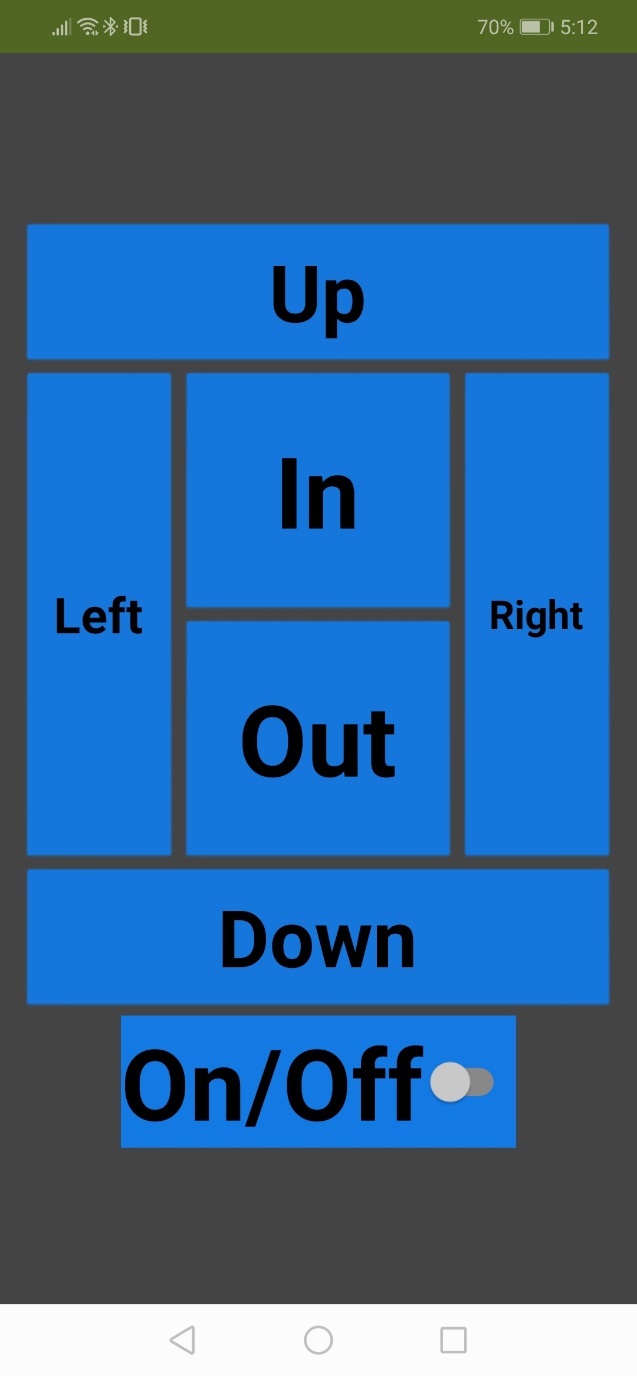
Body Mount (Modified Backpack), will be further modified later in development to allow access to have an open back region

Constructed Housing

3D Modelled Designs of Housing

3D Modelled Design of Head

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type of test | What is being tested? | Expected result | Actual result | Action taken (if any) | Evidence | Notes |
| Expected | Under control of a test code, the head’s gyration should be controlled | Head gyration can be turned on and off on command |  |  |  | Postponed for next sprint as the related task was substituted out |
| Expected | The access of the Arduino board’s pins through the housing | Pins should be reachable by jumper cables through the holes in the housing | All pins I could foresee using are accessible |  |  |  |
| Expected | The micro USB port of the Arduino board’s accessibility through the housing | The housing should not obstruct the cable from reaching the port | No obstruction |  |  |  |

**Sprint 3**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type of test | What is being tested? | Expected result | Actual result | Action taken (if any) | Evidence (if applicable) | Notes |
| Expected | Head’s ability to spin, using the provided controller and a temporary circuit and Arduino script | Head spins at a rate specified by the script | As expected |  |  |  |
| Expected | The connection between the backpack and the base of the arm | The base has minimal tilting out from the backpack | The base tilts out significantly but I think it’s reduced as much as possible. The connection (using zip ties) seems like it will degrade the bag however | From “consumer” suggestion (my dad) I printed a plate to sit on the inside of the backpack to reduce the zipties’ wear onto the bag |  |  |
| Expected | The physical connection between the base and its cap | The connection is strong enough to hold itself when the apparatus is its average position | As expected |  |  | The connection is not as tight as it could be, to reduce friction between the spinning cap and the base |
| Expected | The physical connection between the base cap and the first arm-stalk | The connection is strong enough to move successfully when guided and hold itself up well | As expected |  |  | As previously designed, there are rubber bands in place to assist the motor in holding the weight of the arm |
| Expected | The physical connection between the first and second arm-stalks | The connection is strong enough for the second arm-stalk to pivot in a study manner and hold itself well | The connection is sturdy, but the first stalk’s servo motor can’t freely the weight of the second stalk | A new set of stalks was printed with hooks to place rubber bands on, helping hold the stalks together |  |  |
| Expected | The physical connection between the second arm stalk and the head | The connection is strong enough for the head to pivot in a sturdy manner | As expected |  |  |  |
| Expected | The rotating base’s ability to rotate | Using a scrap Arduino script, the base can rotate to points within its range | As expected |  |  |  |
| Boundary | The rotating base’s ability to rotate to the ends of its range | Using a scrap Arduino script, the base can rotate to its max/min angles | Rotates successfully, though the base cap seems to tilt out at these extreme values | Base cap tightened |  |  |
| Invalid | The rotating base’s input | Using a scrap Arduino script, when given an input outside the motor’s range, the base either doesn’t move or moves as close as it can | Rotates to the closes point it can (maximum or minimum) |  | As above |  |
| Expected | The shoulder joint’s ability to rotate | Using a scrap Arduino script, the shoulder joint can rotate to angles within its range | As expected |  |  |  |
| Boundary | The shoulder joint’s ability to rotate to the ends of its range | Using a scrap Arduino script, the shoulder joint can rotate to its max/min angles | Shoulder rotates fine to its minimum angle but not to its maximum angle of 180 degrees(too much weight) however in practice no angle over 90 degrees will be necessary so this is acceptable |  |  |  |
| Invalid | The shoulder joint’s input | Using a scrap Arduino script, when given an input outside the motor’s range, the shoulder either doesn’t move or moves as close as it can | Joint moves as close as it can to the invalid angle |  | As above |  |
| Expected | The elbow joint’s ability to rotate | Using a scrap Arduino script, the elbow joint can rotate to angles within its range | As expected |  |  |  |
| Boundary | The elbow joint’s ability to rotate to the ends of its range | Using a scrap Arduino script, the elbow joint can rotate to its max/min angles | As expected, although the minimum angle was not tested as the arm is physically obstructed to this position (closest possible angle tested instead which encompasses all necessary angles) |  |  |  |
| Invalid | The elbow joint’s input | Using a scrap Arduino script, when given an input outside the motor’s range, the elbow either doesn’t move or moves as close as it can | Joint moves as close as possible (not tested on minimum angle for reasons above |  | As above |  |
| Expected | The wrist joint’s ability to rotate | Using a scrap Arduino script, the wrist joint can rotate to angles within its range | As expected |  |  |  |
| Boundary | The wrist joint’s ability to rotate to the ends of its range | Using a scrap Arduino script, the wrist joint can rotate to its max/min angles | As expected |  |  |  |
| Invalid | The wrist joint’s input | Using a scrap Arduino script, when given an input outside the motor’s range, the wrist either doesn’t move or moves as close as it can | Joint moves as close as possible |  | As above |  |
| Expected | The head motor can still operate, when connected to the other parts | Head spins at a rate specified by a scrap script | As expected |  |  |  |

Discoveries too general to be applied to any one test:

* Upon the initial construction, motors were attached at random angles. It was required to synch the programmable range of the servos to the angles at which the connection components were mounted, and so a set of ranges was determined for each joint, to best encompass the possible required positions.
* The intended power supply, a double USB port power bank, stops outputting power after roughly 15 seconds of powering either the Arduino or the motors of the apparatus. It would seem the power bank has built-in current requirements so that circuits drawing low amounts of current are terminated, as my other lower quality power bank seems to work, however this only has one USB port so cannot power the apparatus in a fully portable manner. I will continue testing power sources in the next sprint but will most likely use two low quality ones without this current requirement.