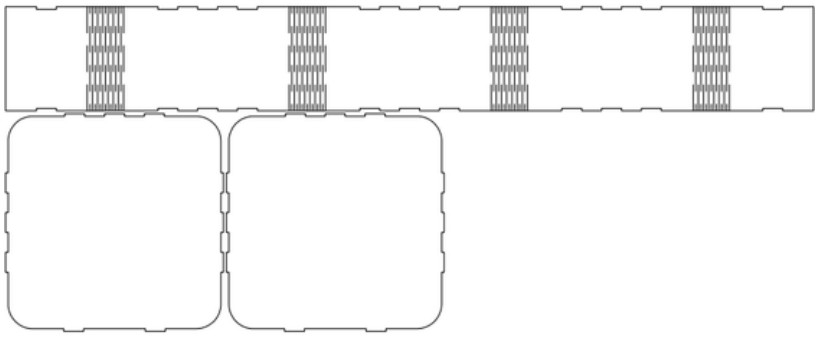
STEP 5 - BUILDING THE PROTOTYPE

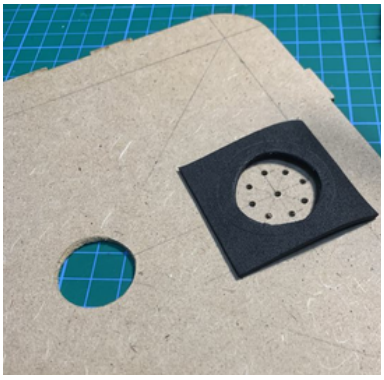
1

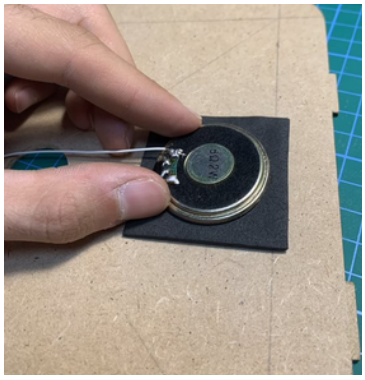
We have designed the box using the AutoCad program with the necessary dimensions to support the whole prototype. Then we have cut it with a laser machine and we have glued only the lower part thanks to the tabs that are on the sides. The upper part has been left free so that the whole electronic system can be correctly manipulated.



2

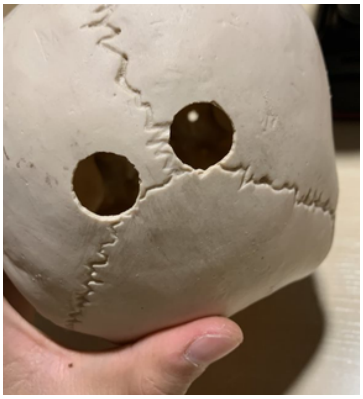
Next, we marked a 25mm hole in the center of the box using a flat drill, to be able to insert the support shaft of the skull. Subsequently, we have made 8 holes in a circle and another central hole to facilitate the exit of the speaker from the inside of the box.





3

Then, we holed the eyes of the skull with a 5mm drill bit to insert the LEDs, two more holes were drilled in the back of the skull for the ultrasound sensor and finally a last one to hold the shaft.



4

Then, to allow the movement of the jaw, the space of the cheekbones of the skull has been used to fit the servo that will allow this function. For this purpose, hot silicone was used to hold it in place and prevent it from coming loose.

Then, to join the wing of the servomotor with the jaw pierced by the teeth, a clip has been used to transmit the movement from one component to another, in order to achieve this realistic effect.

5

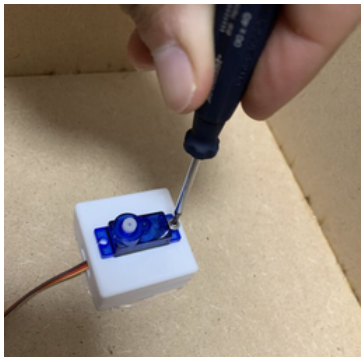
To join the head with the shaft, a 3mm diameter hole has been drilled in the center, to insert an M3 screw that will be the link between all the elements. So the order of components would be as follows: bolt, flyer, head, chair block, flyer and finally nut. In this way, we ensure that everything is fixed and that a good transmission of the movement of the servomotor to the head is followed.

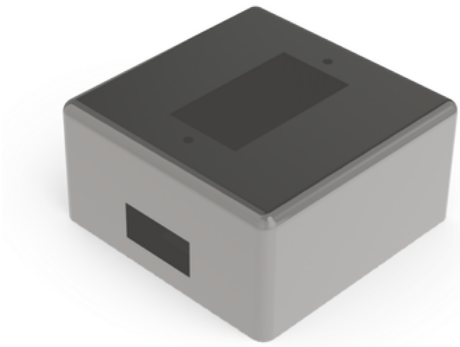
6

To transfer the motion from the servomotor to the shaft, the wing was first detached from the servomotor and glued to the seat block that goes on the bottom of the shaft. The entire assembly was then reattached to the servomotor in the following order: servomotor base, seat block and wing. In this way, by joining the whole assembly together, it allowed the motion to be transmitted to the head.

7

To improve the hold of the servo in the base of the case, we designed a square-shaped 3D part so that, when the head movement was executed, none of the parts would become unbalanced and interrupt the action.





8

As long as the skull is decorated, this is a free choice step. In our case, a Halloween themed hat has been attached to the head and spider webs with plastic spiders have been scattered all over the box.