TU-LIGHT

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A nightstand companion that responds to ambient light, never leaving you in the dark.

CLOSED

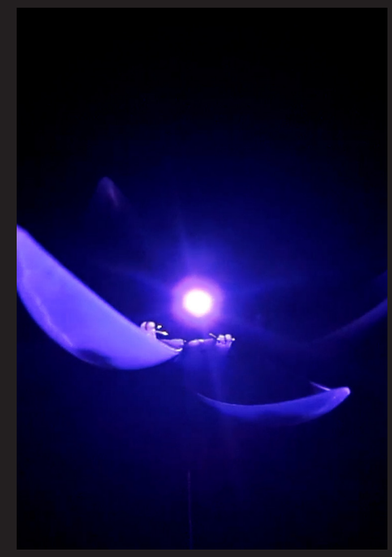
During the day, or when the tulip is situated in a lit environment, it will remain in the un-bloomed position.

INTERIM

When the tulip detects a decrease in ambient light, the LED will turn on and the petals will begin to open.

OPEN

At full bloom, the petals will be fully open and the LED will remain on, serving as a night light in dark surroundings.

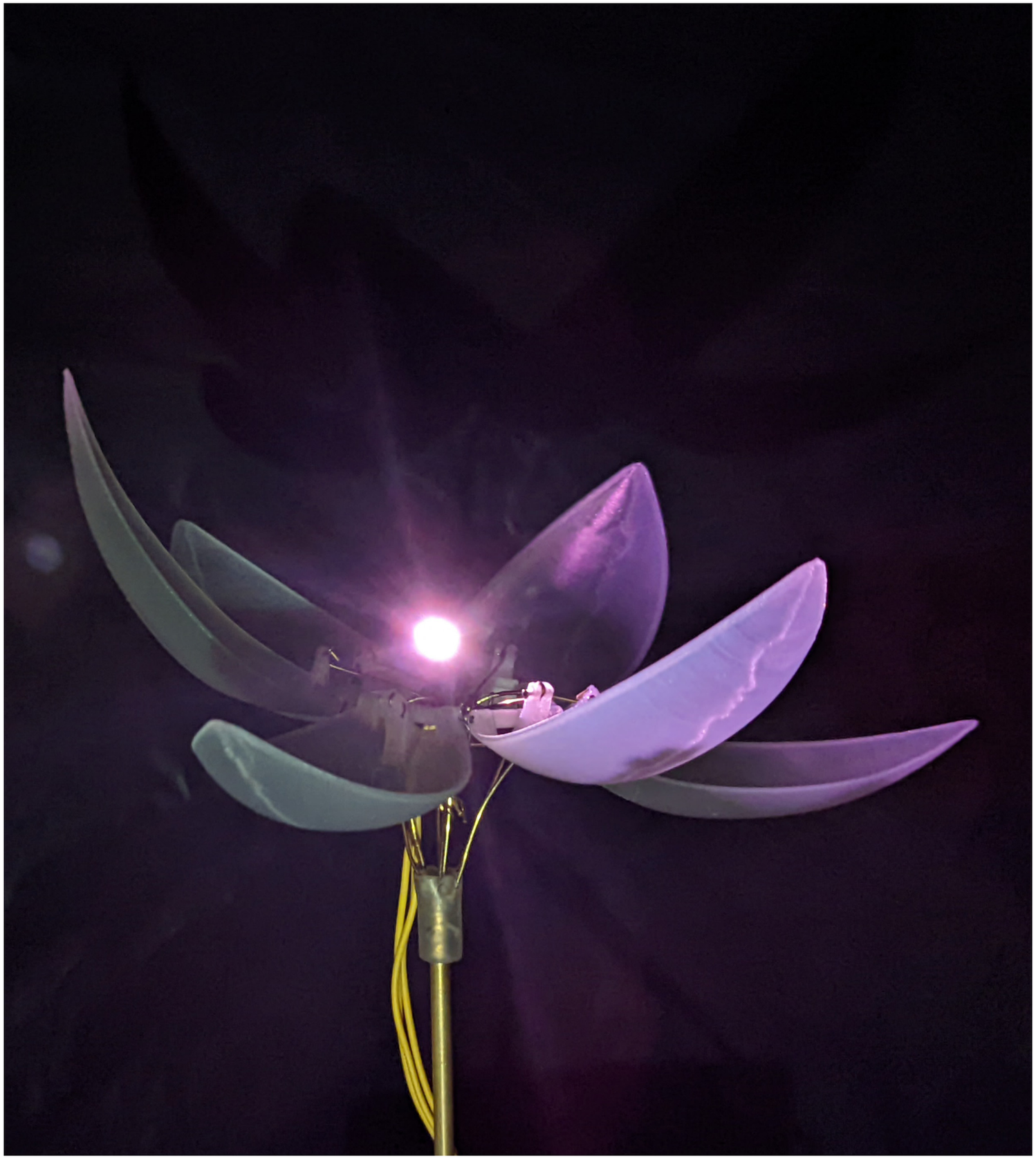


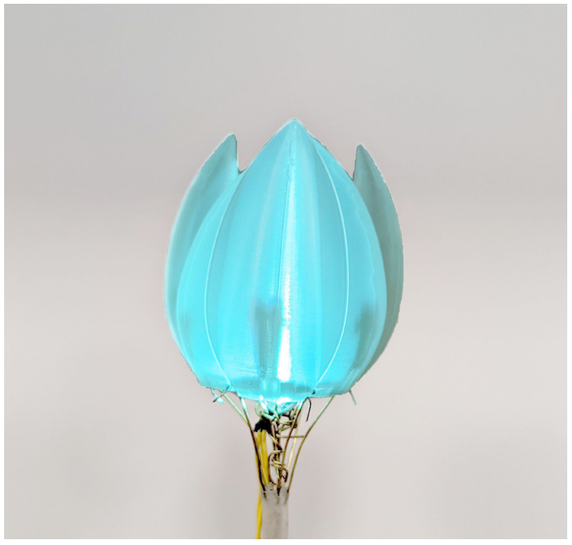
THE CONCEPT

Our concept was inspired by Jiří Praus, a maker based in the Czech Republic who has created many iterations of mechanical flowers. His first iteration was made entirely out of brass wire and tubing, however he has since started mass producing mechanical flowers with 3D printed parts.

We wanted to create a product that responded to environmental stimuli, and decided on a night light that blooms and turns on when in a dark environment. The flower automatically closes and the light turns off when exposed to light.

The colour of the light can also be changed by pressing a button, cycling through four modes - pink, teal, blue, and rainbow.



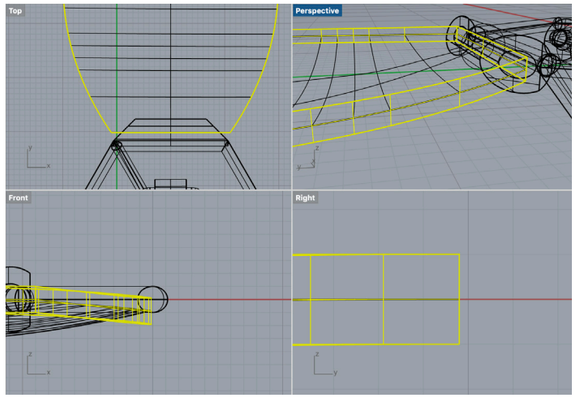


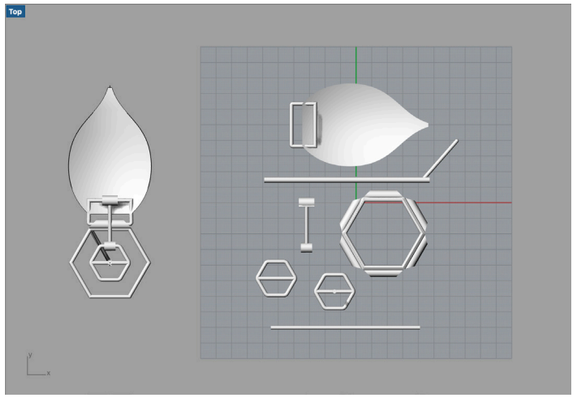
THE PROCESS

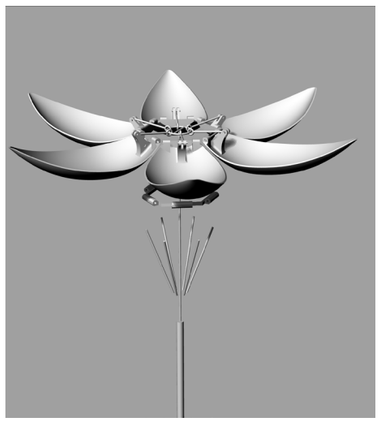
We chose to use a hybrid approach, by 3D printing the petals to ensure they were of a consistent size and shape, and to achieve the diffused light effect seen through the transluscent material.

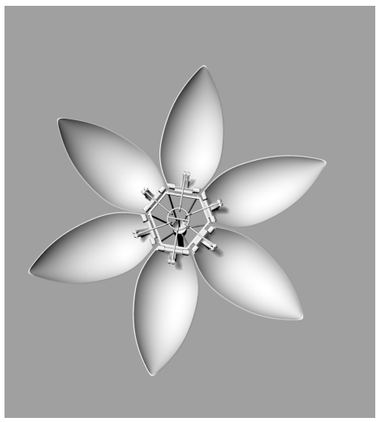
The hinge structure and support mechanisms were created from a combination of brass wire, brass rod, and sewing needles. This allowed us to modify the mechanism to ensure it moved the petals as intended.
We began by 3D modeling the flower's design and structure in Rhino, to ensure we knew which parts we needed to build, and how the flower's mechanism would function.

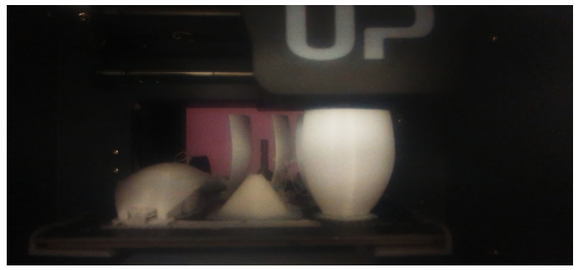
We went through several rounds of 3D printing until we settled on the transluscent PLA filament which ended up being easier to work with than our initial attempts with ABS.

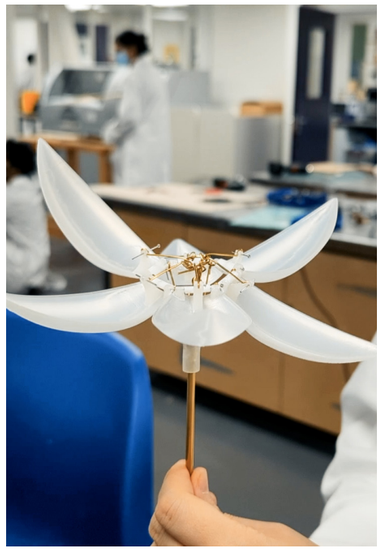


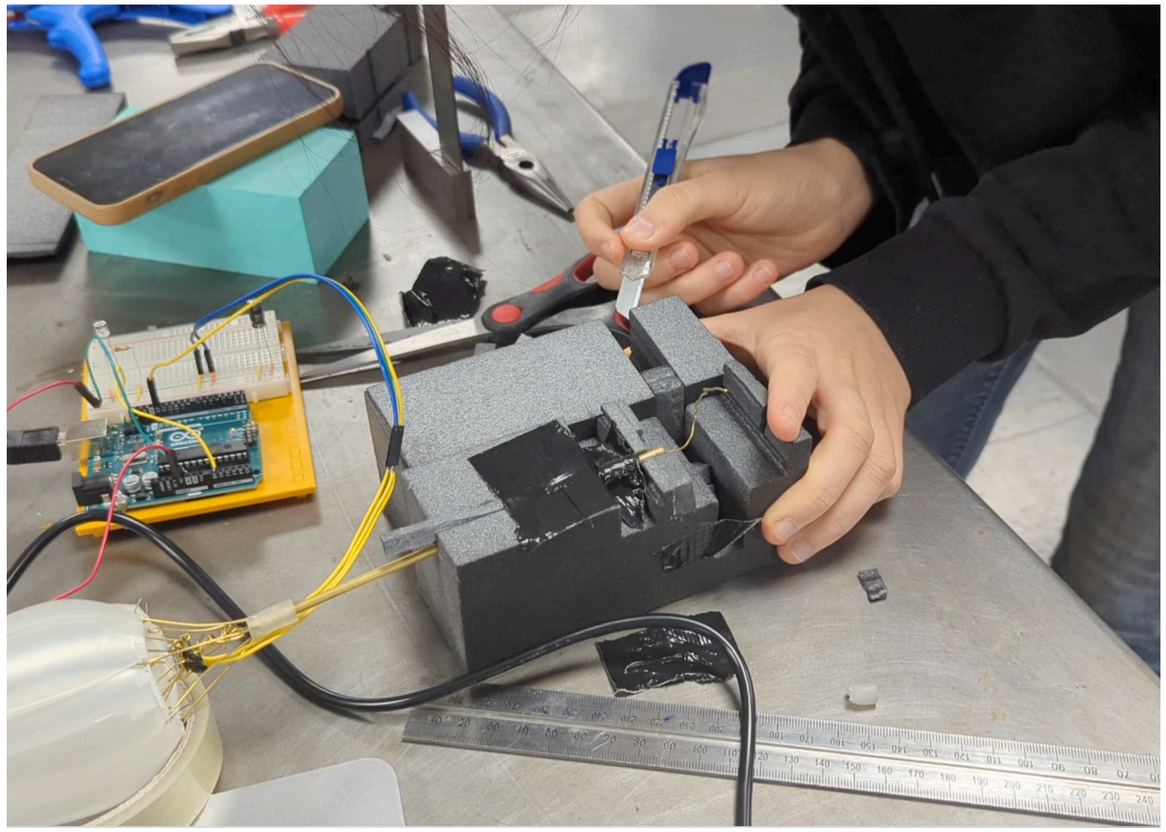




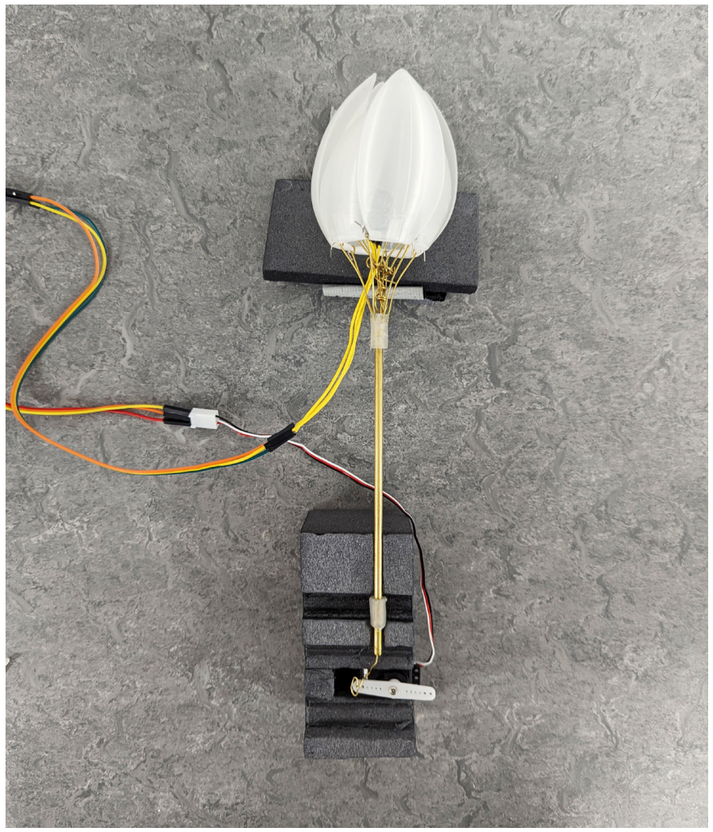


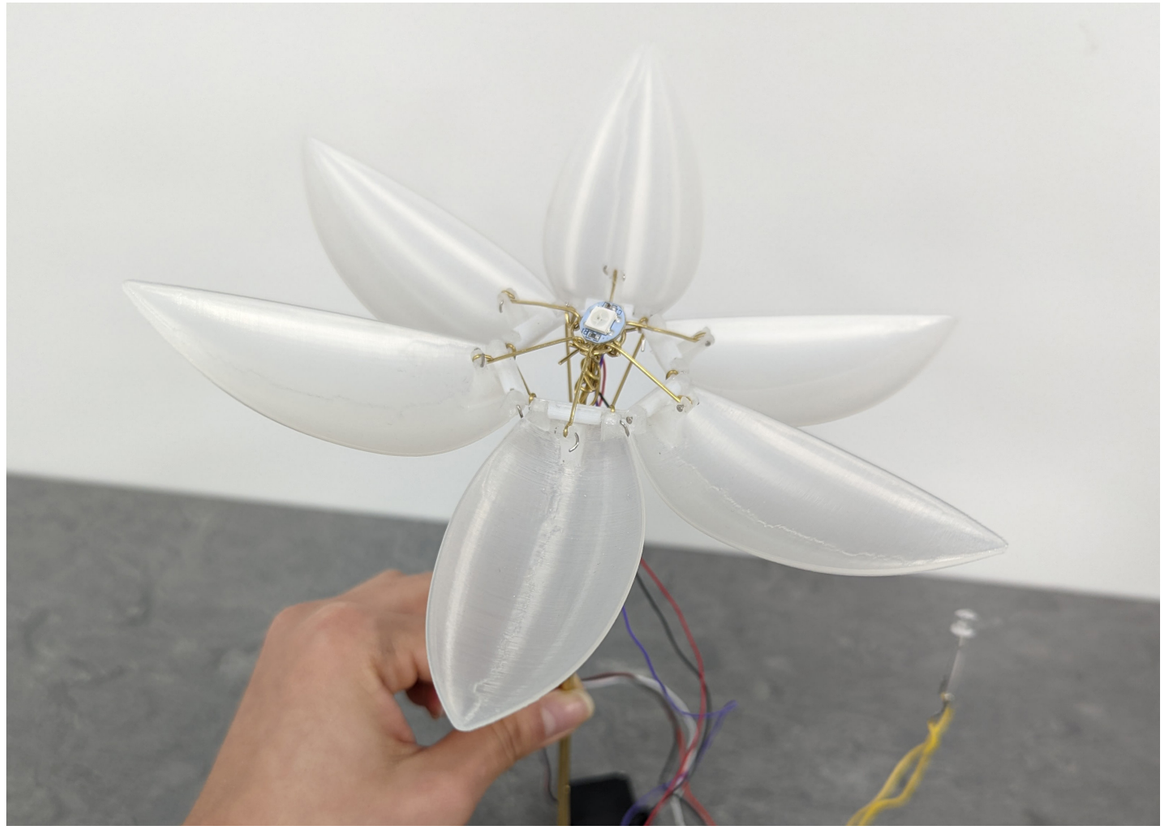






Creating the housing for the servo motor





HOW IT WORKS

The petals are connected to a central support rod which serves as a push rod and runs through a brass tube. The push rod is connected to a mini servo motor that moves the push rod to open and close the petals.

The LED is mounted at the center of the petals, on top of the push rod. The colour of the LED can be customised through the Arduino code. The photodiode measures ambient light levels; when it detects light, the servo moves to the vertical position to close the petals, and the LED remains off.

When the photodiode detects darkness, the LED turns on and the servo motor moves down to the horizontal position and pulls the push rod to open the flower petals.