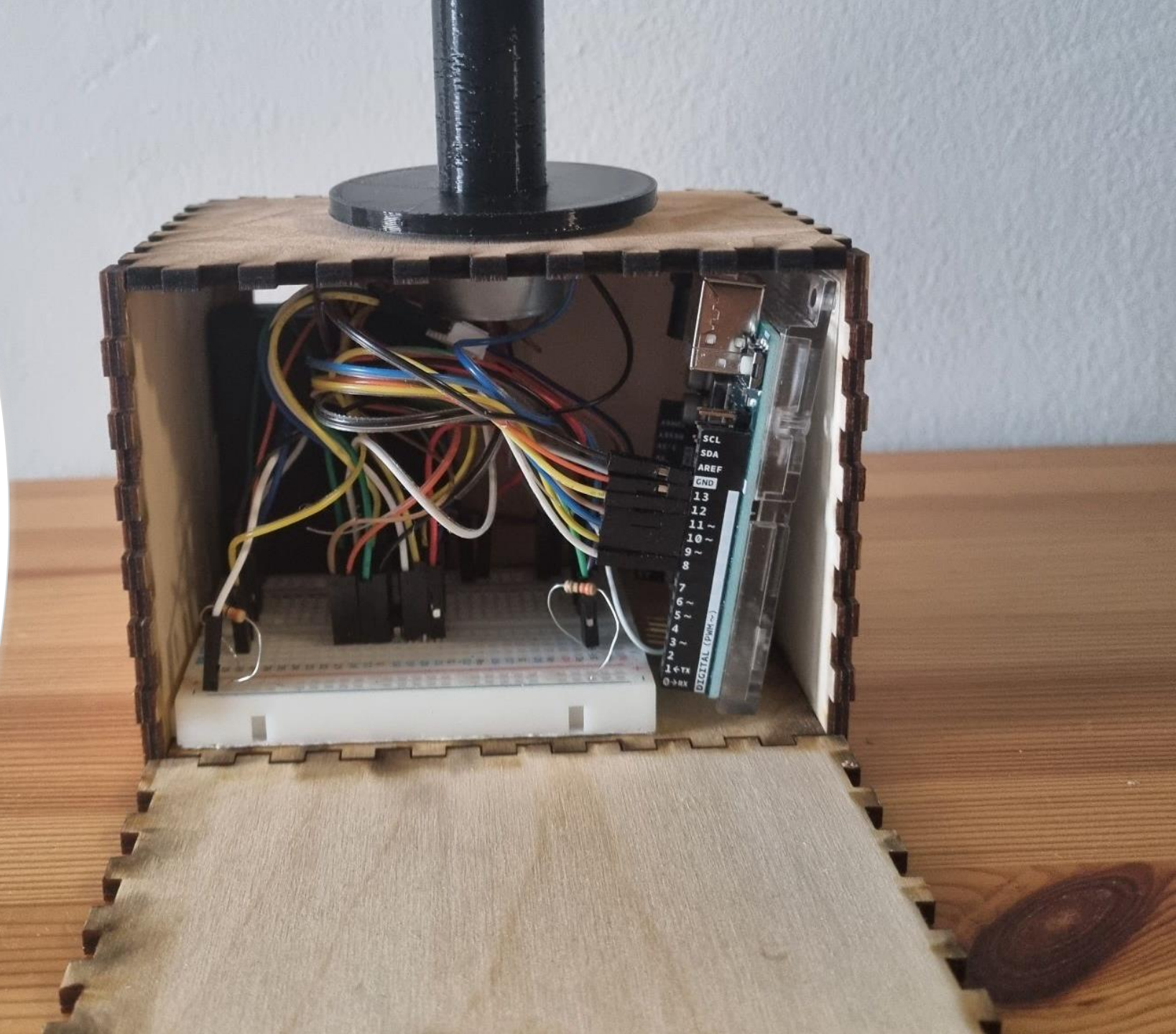# Self-orienting solar panel

Miro Kakkonen
Alina Piikivi
Jeremias Nevalainen
Aleksanteri Kylmäaho

Main functionalities

- Detects light with two ambient light sensors

- Stepper motor rotates the panel towards the greatest source of light
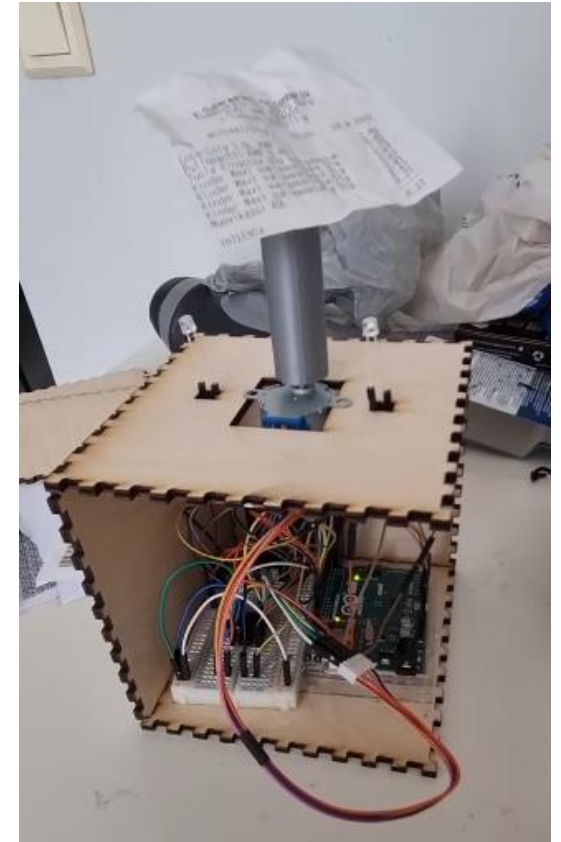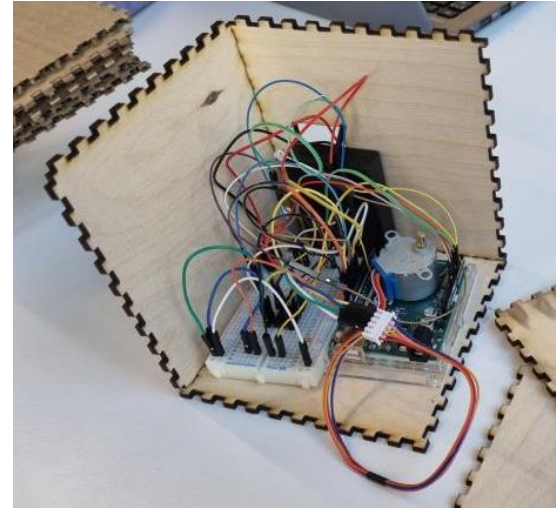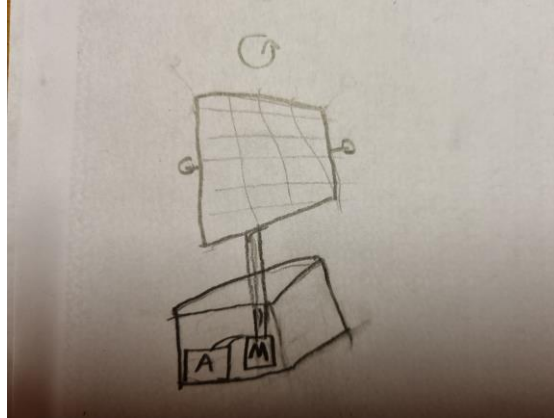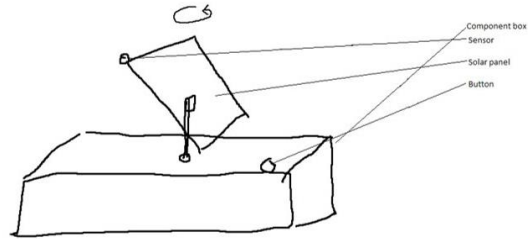
- Easily reassembled

List of components

- Arduino Uno
- Solar panel
- Ambient light sensor x2
- Battery compartment + AAA Battery x4
- Stepper motor
- H-Bridge
- Breadboard
- Cables
- Tape, electrical tape & superglue

Self-made:

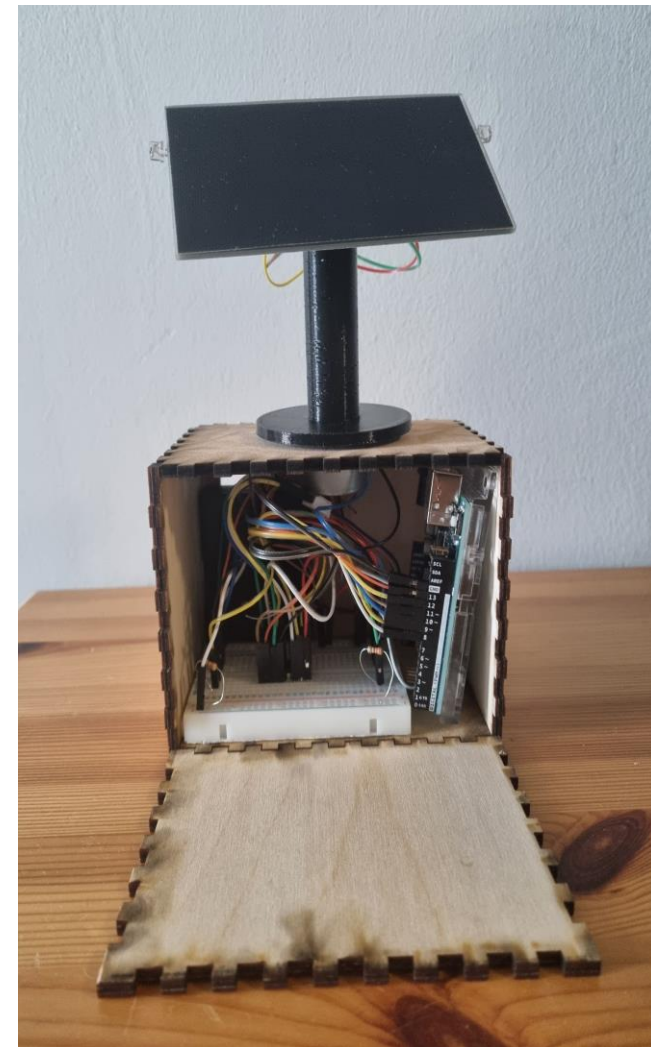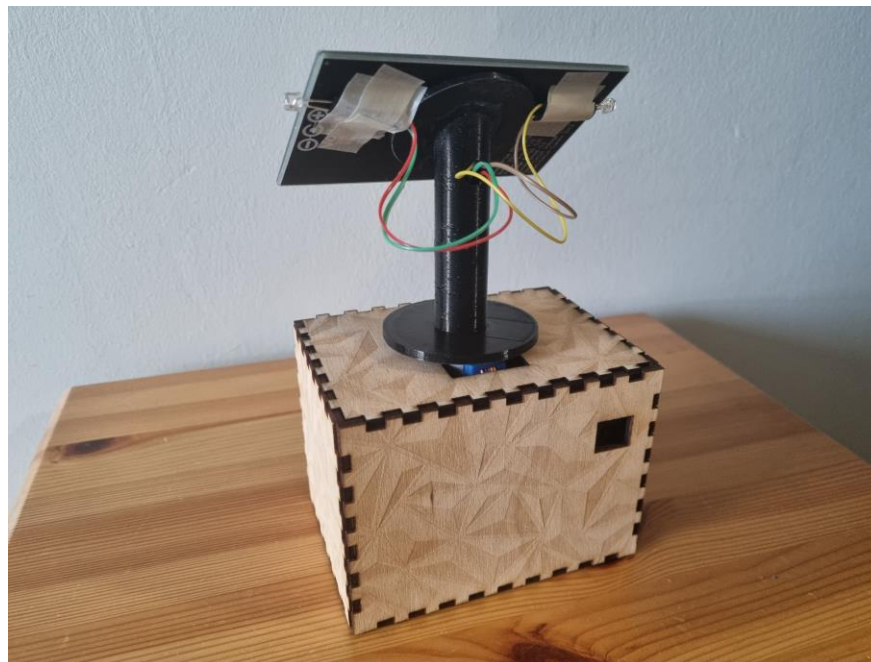- Box (plywood, lasercut)
- Panel stand (3D printed)

Design

Video of first prototype: https://www.youtube.com/shorts/B_9uxL79UF0

Final version

Video:
https://twitter.com/mirokakkone
n/status/1521149639134699526

General workflow & fabrication process

- Started with the electronics & coding
  - Getting some readings from the ambient light sensors
  - Making the motor spin
  - Combining them to turn towards the sensor receiving more light
  - Lots of research on the correct wiring…
- Used laser cutting to create the box housing all the electronic components
- 3D printed the stand for the solar panel
- Stiched everything together with tape and superglue
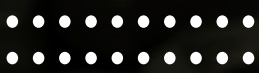
Troubleshooting

- Had some trouble getting the stepper motor to spin and take power from the batteries
  - Lots of googling and asking for advice in tutoring sessions
- One of the light sensors was broken
  - Got a replacement
- Some problems with faulty 2D/3D models
  - Got advice, made new ones
- Decided to scratch the following functions due to time constraints:
  - Connecting the solar panel to a rechargeable battery
  - Making the device weatherproof
- Team members getting sick

Reflections & lessons learned

- Skills learned:
    - 2D & 3D modeling
    - Arduino programming & wiring
    - Laser cutting & 3D printing
    - Working in group and project management
- The final product still looks somewhat sketchy from certain angles, but on the whole we are quite happy with the result