Functionality
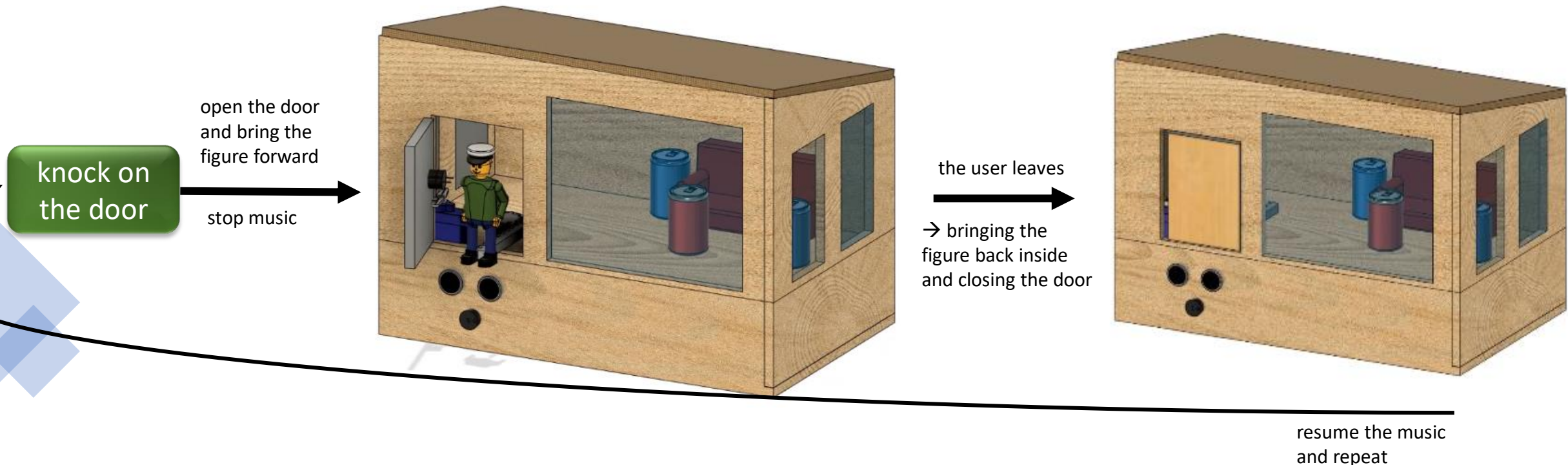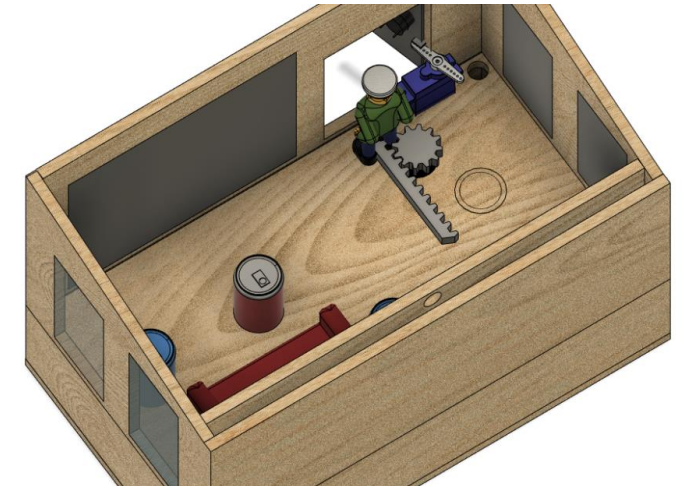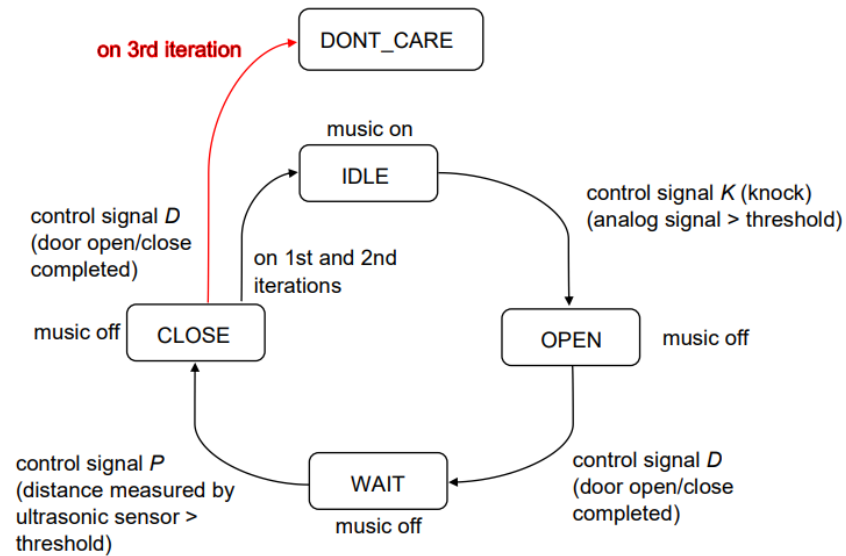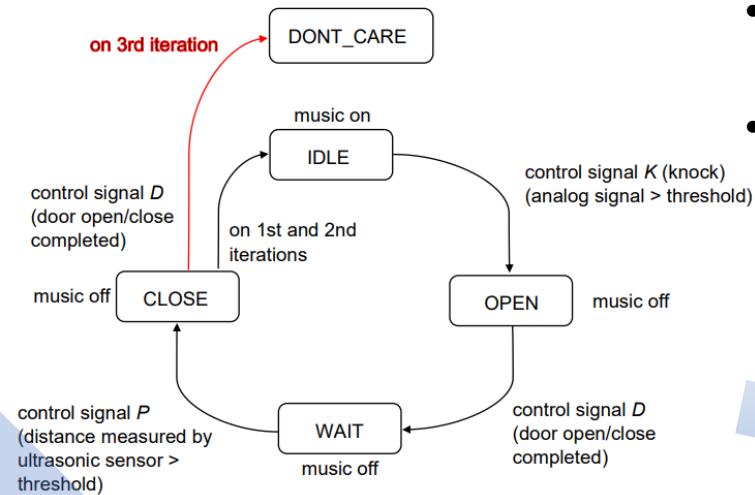
Video demonstration is provided at https://www.digifab-oulu.com/2020/04/13/wakeywakey-machine-week-6-decorating-the-house/.

Programming

Writing the code

"State machine"

on 3rd iteration

DONT_CARE

music on

IDLE

control signal *K* (knock)
(analog signal > threshold)

control signal *D*
(door open/close
completed)

on 1st and 2nd
iterations

music off | CLOSE

OPEN | music off

control signal *P*
(distance measured by
ultrasonic sensor >
threshold)

WAIT

control signal *D*
(door open/close
completed)

music off

LEDs

- separate control for each LED (6 in total)
- a function assigns a random state for each LED when called
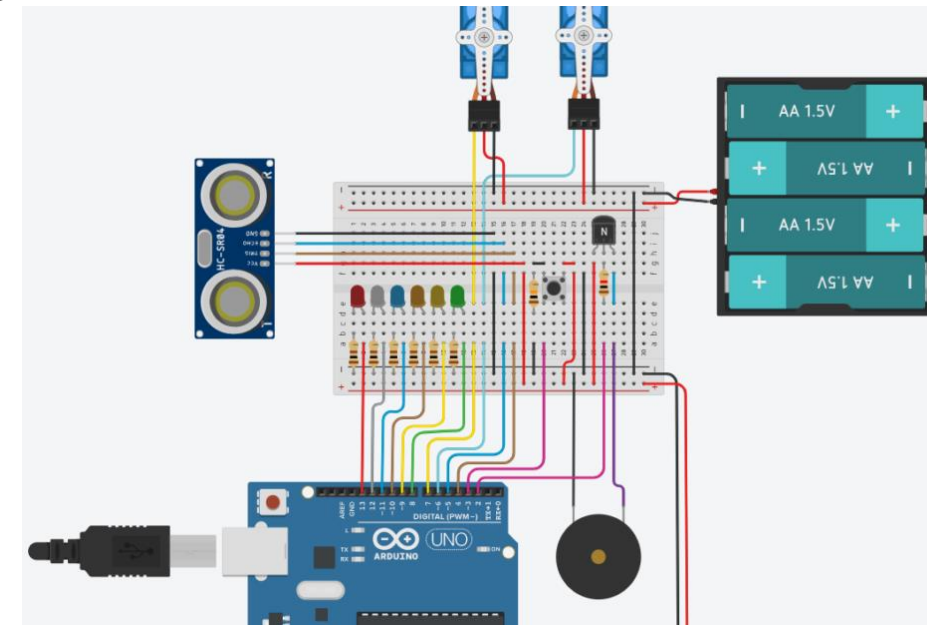 → vector [0 1 1 0 0 1]

Servos

- gradually open/close the door and bring the figure forward/inside
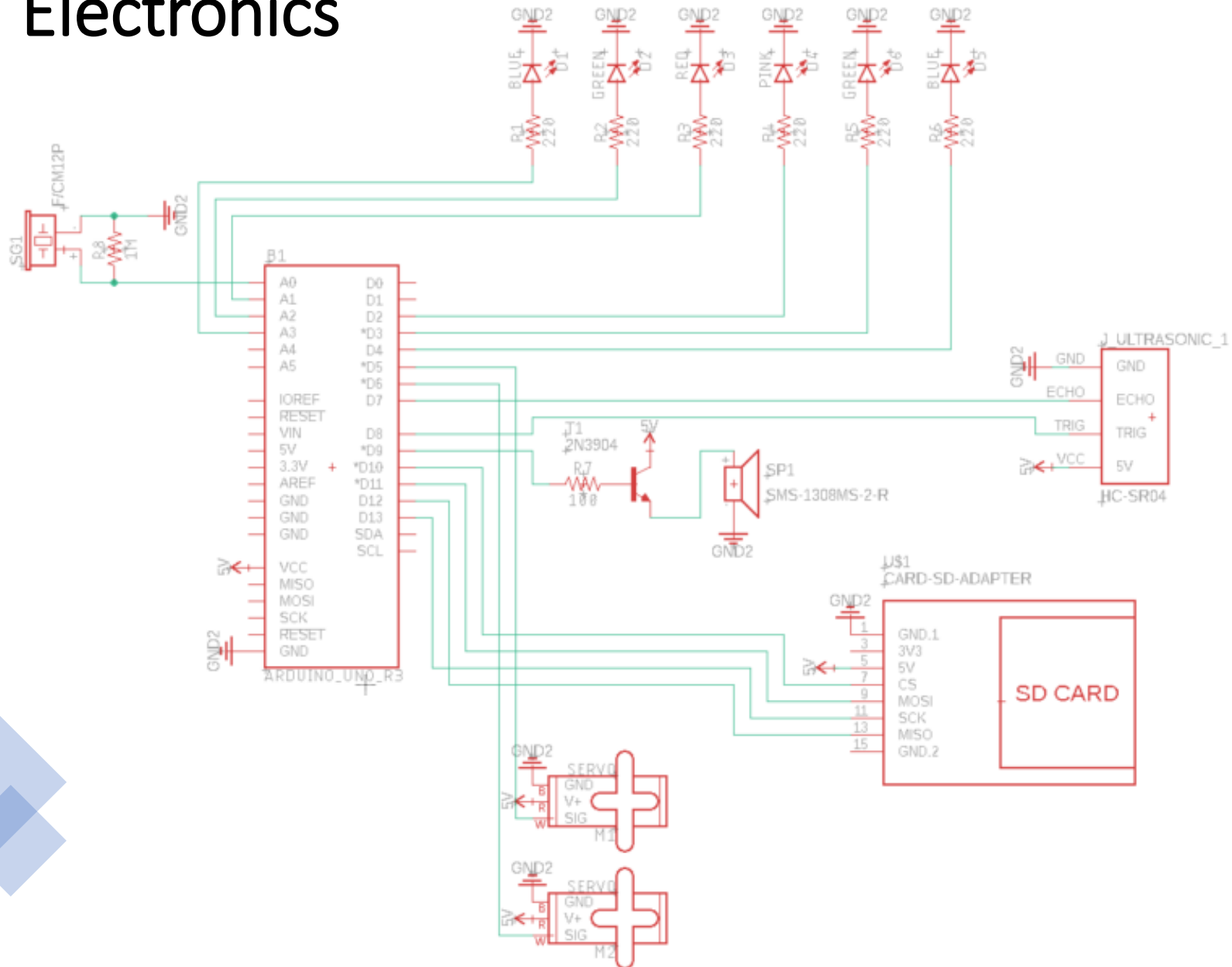
Main loop & music

- govern the states
- play the music with an external library (TMRpcm)

TinkerCAD prototype

- piezo knock sensor simulated with a pushbutton
- used the *tone*-function to play simple melodies instead of TMRpcm
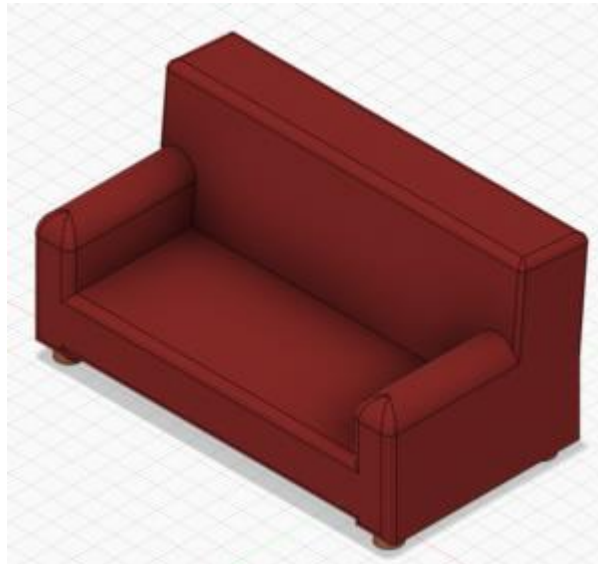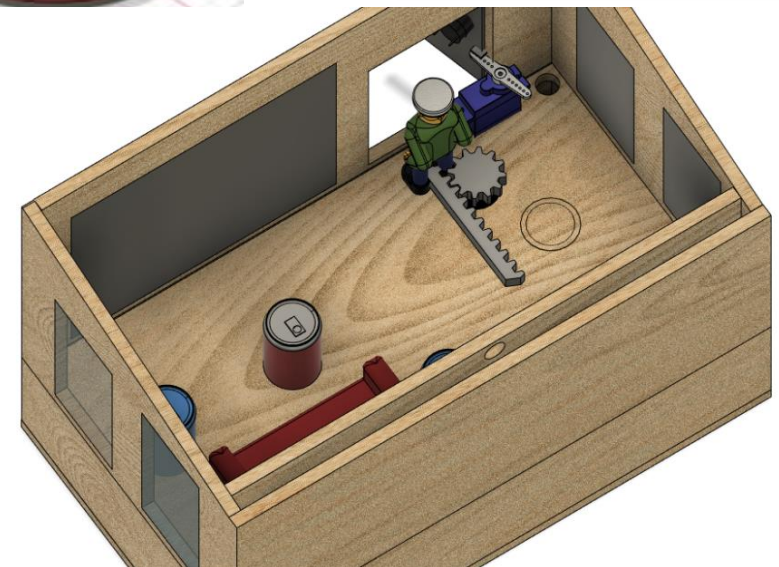
Electronics

3D models

The figure wearing its cap

3D prototype to visualize the house

Laser cut model

To be done:
- holes for the ultrasonic sensor and speaker
- hinge and an arm for the door and the servo.