

# Tech Research

## Table of contents

- Idea
- Requirements
- Possible methods
- Component research

## Idea

The plan is to create a laser maze game that people can move through while attempting to not hit any.

## Requirements

- Functional Requirements:
  - Maze needs visible lasers
  - Something needs to happen when the user “touches” a laser
- Non-Functional Requirements:
  - Easy to transport
  - Have an as simple as possible setup
  - Must work consistently

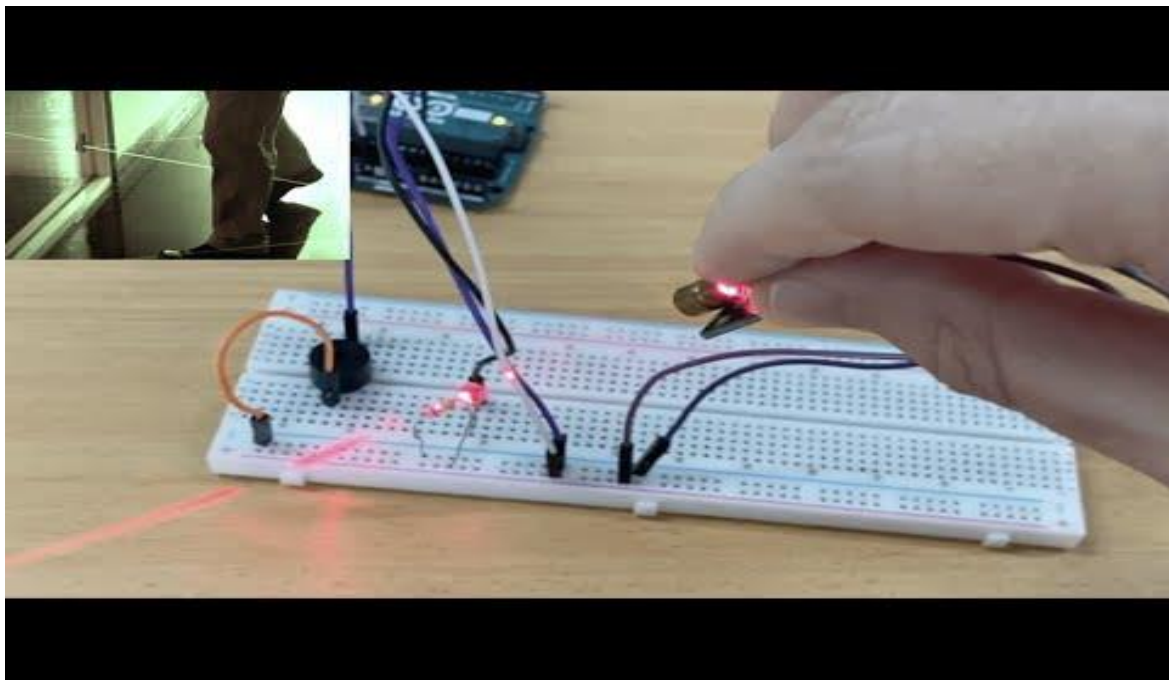
## Possible methods

### Laser transmitter and receiver module

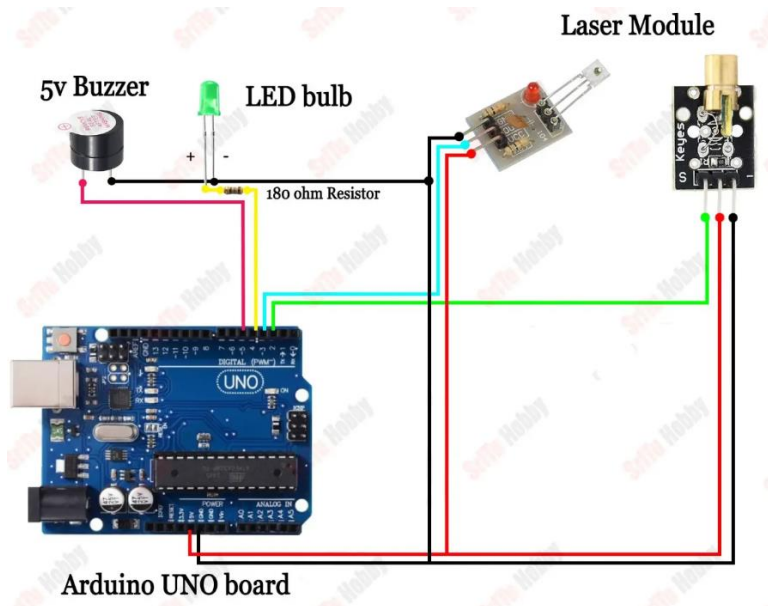
Use laser transmitters and receiver modules to transmit and detect active lasers and see if one is broken.

This works because the receiver will always “see” the laser if the light doesn’t get blocked by the user.

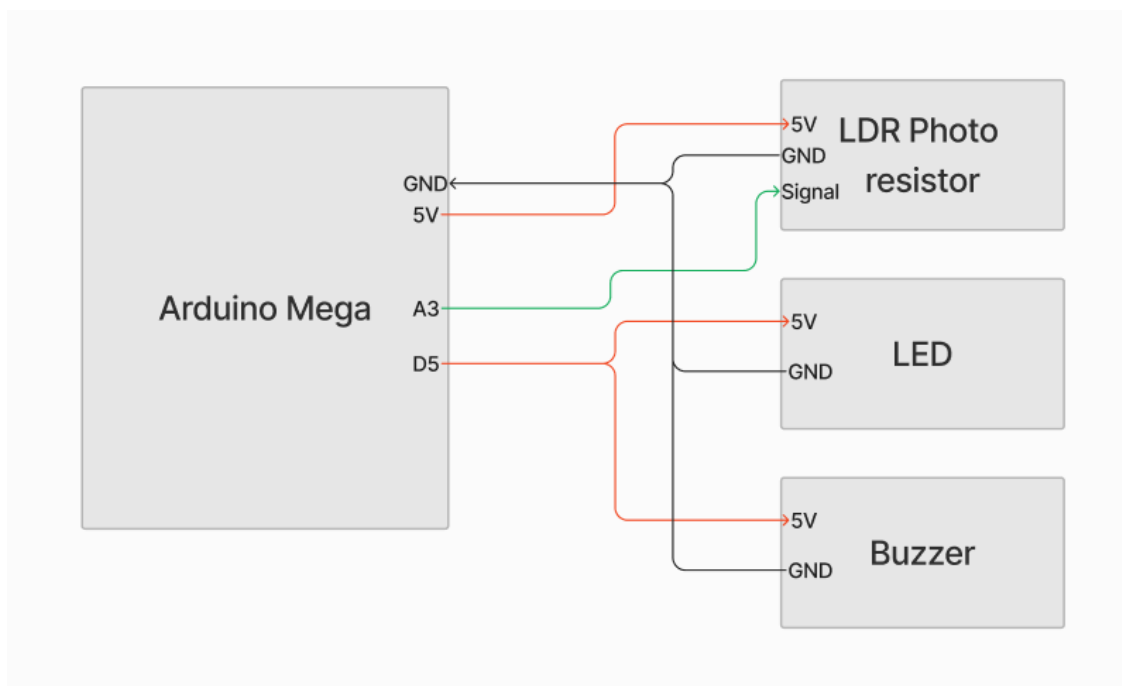
[https://www.youtube.com/watch?v=iN6MgaUf\\_Sg](https://www.youtube.com/watch?v=iN6MgaUf_Sg)

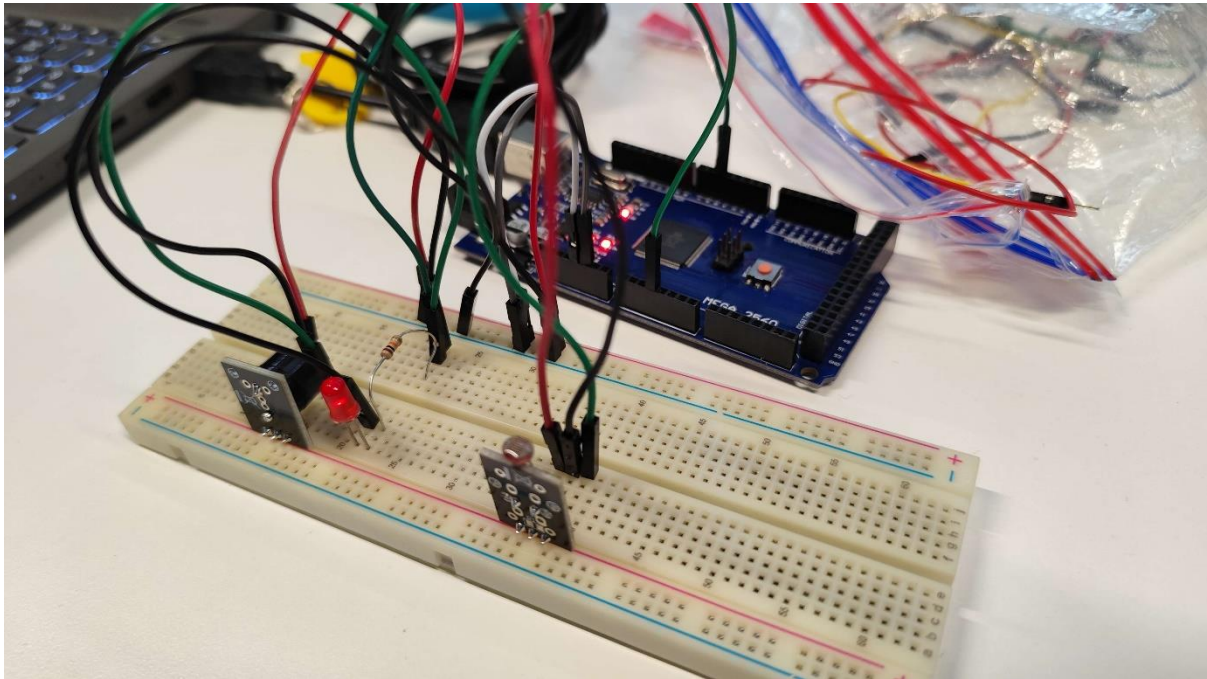


Proto 1:



Hardware Diagram





### **Laser transmitter and a ToF distance sensor**

Use the laser purely as visual aid and have the distance sensor detect if the laser is broken.

This works because the moment the player blocks the path of the distance sensor the measured distance will suddenly be shorter than it was and so you know the laser was blocked.

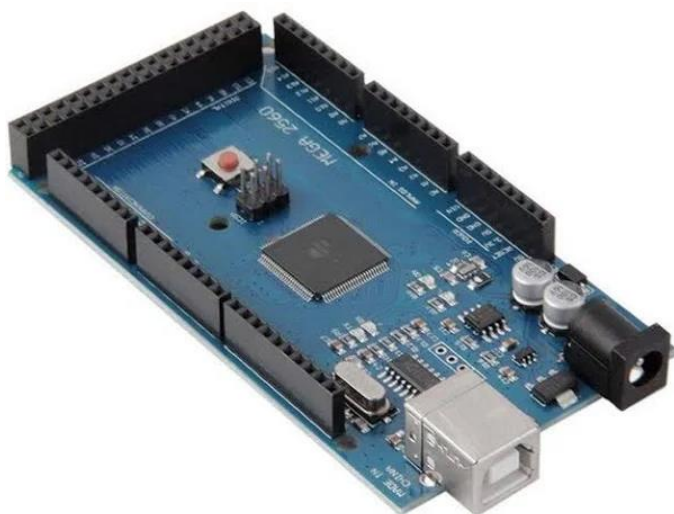
<https://www.youtube.com/watch?v=FsQGe6XXeQE>



## Component research

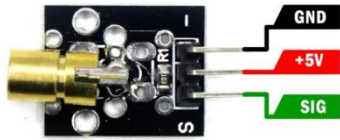
### Arduino Mega

We have deduced that the arduino mega would be the best board for our project as we need a lot of ports to connect sensors.



## Ky008 module

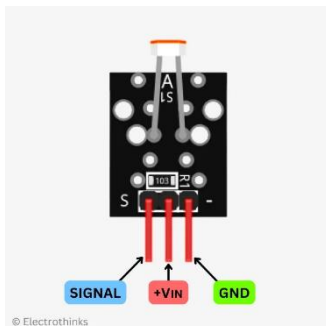
The transmitter that shoots a red laser



Operating Voltage	3.3v to 5v
Output Power	5mW
Wavelength	650nm
Operating Current	< 40mA
Operating temperature	-36°C ~ 65°C
Working temperature	-10°C ~ 40°C
Board Dimensions	18.5mm x 15mm

## LDR resistor

Standard LDR Resistor that can be used to detect differences in light levels so also if a laser is shooting at it.



## TOF Laser Distance Sensor

VL53L1X: <https://www.st.com/resource/en/datasheet/vl53l1x.pdf>

<https://github.com/pololu/vl53l1x-arduino>

<https://www.tinytronics.nl/en/sensors/distance/vl53l1x-time-of-flight-tof-distance-sensor>

Smoke machine

Also ask Mijke

Connection via mqtt or radio, mqtt used for testing strategy.