CYCLODUCK:

A DEPTH SENSOR IMPLEMENTATION JOURNEY

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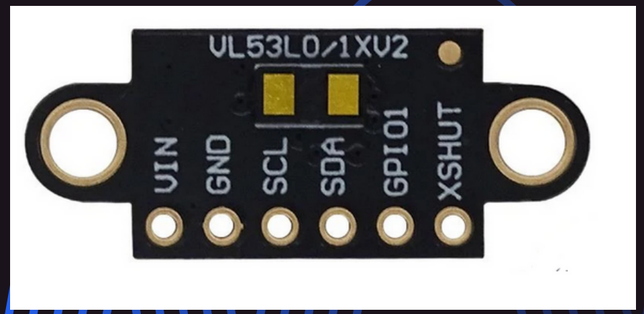
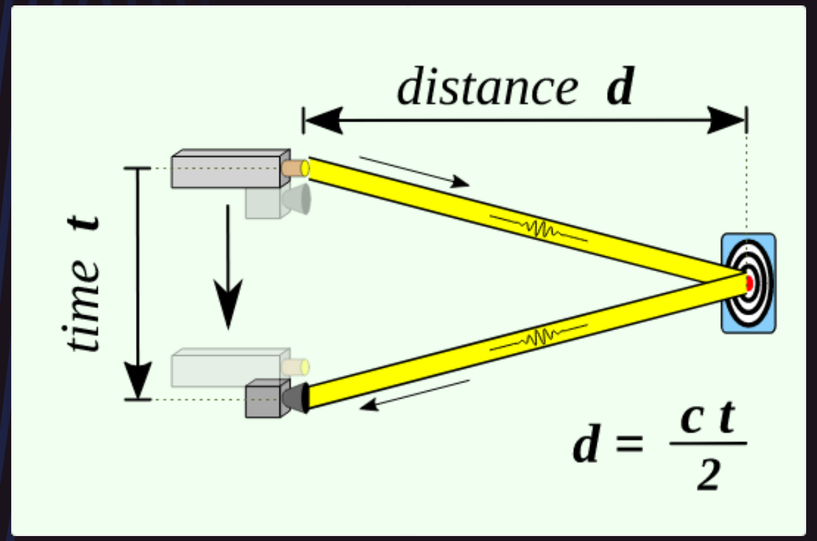
INFINIA Hackathon Series
x
Kargakarga

THE PROBLEM

depth map creation with wide range using 2 servo motors and one ToF depth sensor.





EXISTING STUDIES

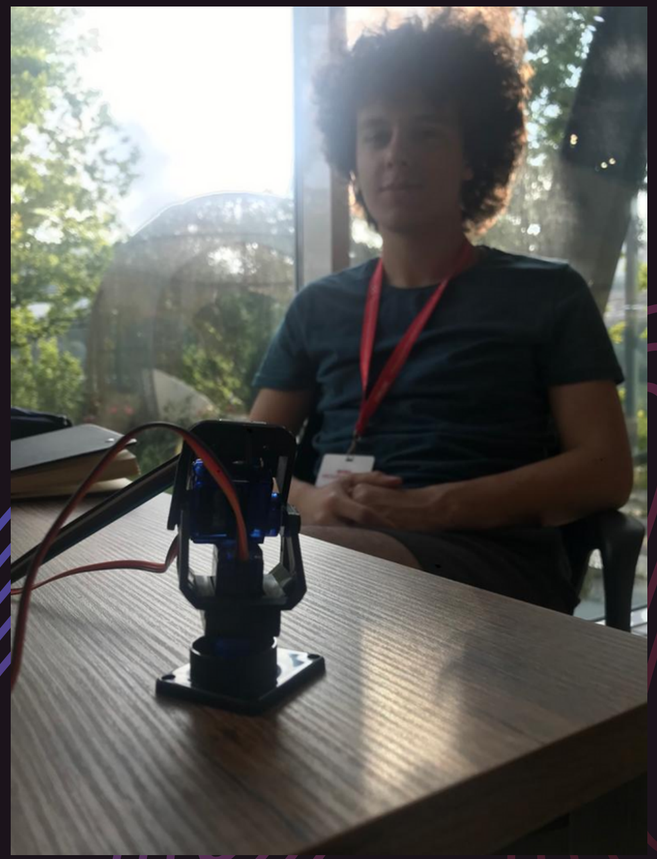
- People Tracking Using a Time-of-Flight Depth Sensor
- A Modular, Direct Time-of-Flight Depth Sensor in 45/65-nm 3-D-Stacked CMOS Technology
- Multi-view image and ToF sensor fusion for dense 3D reconstruction
- An overview of depth cameras and range scanners based on time-of-flight technologies

OUR SOLUTION: CYCLODUCK

a project that creates blue to red heat map, reading values from a rotary pan/tilt platform , puts into an array updating continuously and rendering a depth map.

for better results we have used **bilinear interpolation** and **gaussian filter** on the output on the mentioned work.

HOW IT WORKS?



```
l53l1x_error_codes.h>

dafruit_VL53L1X.h"
ervo.h>

_PIN 2
UT_PIN 3
S 45
S 45
 90
P FOV / ROWS
RT_ANGLE 30

53L1X vl53 = Adafruit_VL53L1X(XSHUT_PIN, IRQ_PIN);

_top;
_bot;

) {

R TOF
```

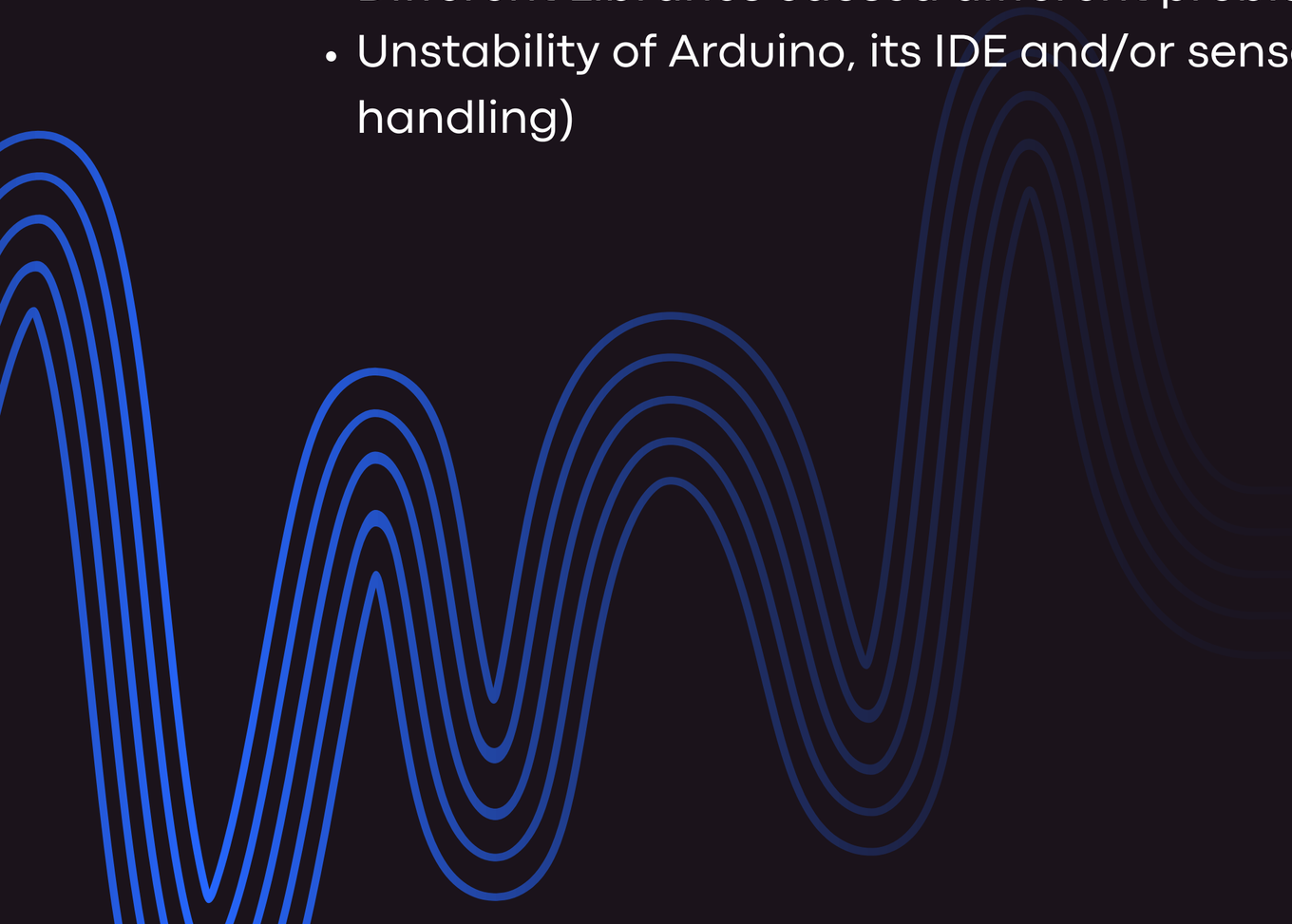
```
ytes (28%) of program storage space. Maximum is 32256 bytes.
se 604 bytes (29%) of dynamic memory, leaving 1444 bytes for local variables. Maximum
```

LIMITATIONS

- physical speed limit of servo motors
- pyhsical limit of ToF sensor (its capabilities are limited to 4 meters)
- computation power of Arduino

OUR STRUGGLES

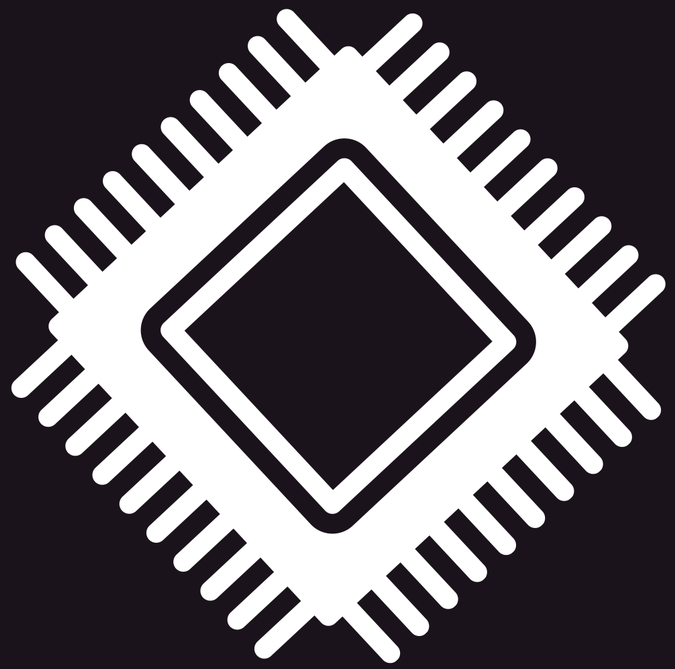
- Different Libraries caused different problems.
- Unstability of Arduino, its IDE and/or sensors. (solved with default case and error handling)



FUTURE POSSIBILITIES

This project can be improved with:

- sensor fusion approach
- better hardware



Thank you for listening!

 /in/eerenn

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