

Open Source LIDAR

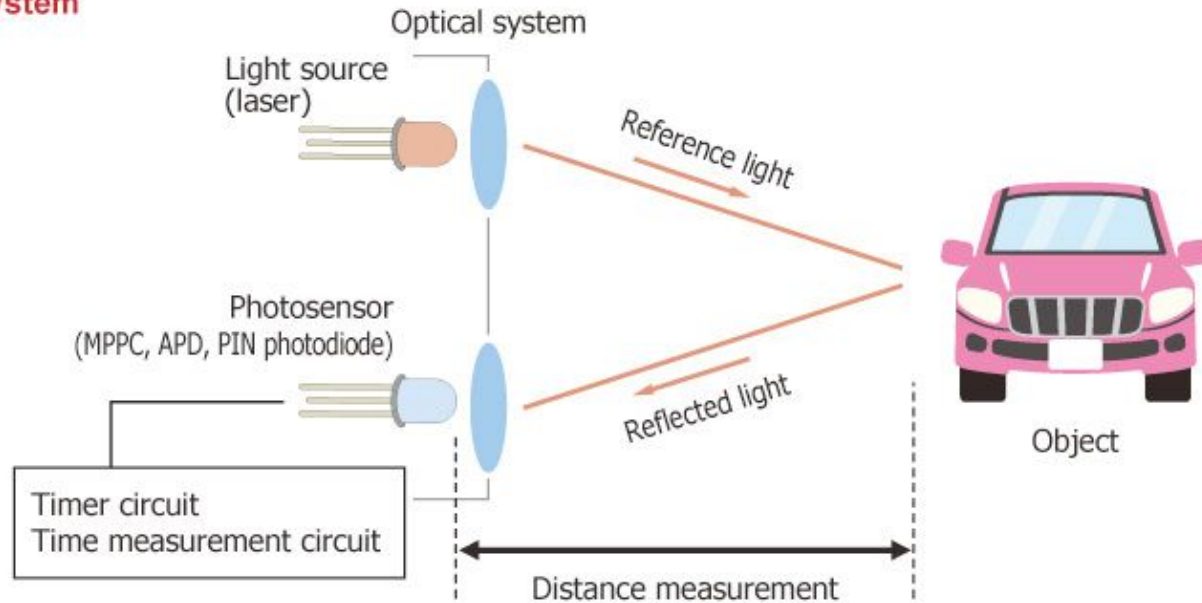


Light Seekers

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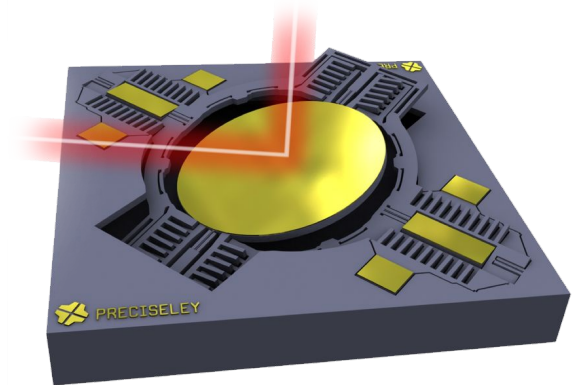
LIDAR Background

> TOF system



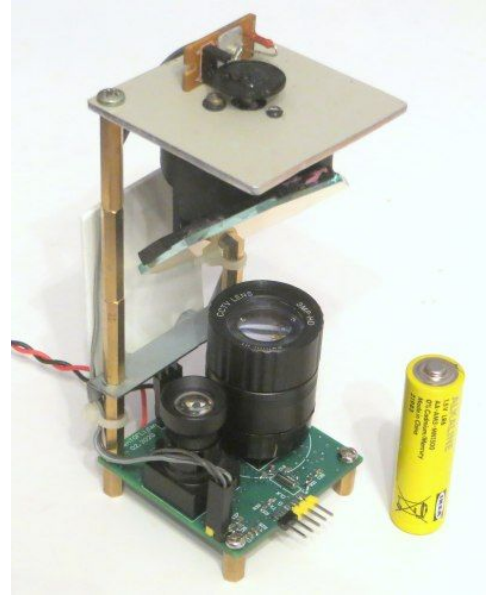
Problem Background

- Research group's MEMS mirror is difficult to use.
- Commercial product do not have non-uniform sampling rate
- MEMS mirror create low and high speed areas of sampling
- We need to copy this capability



Needs Statement

- Sample space in a non-uniform manner
- Help research group to create novel LIDAR



Goals And Objectives

Goal 1: Recreate a working Lidar system based on OpenTOFLidar

Goal 2: Develop a non-uniform sampling system

Goal 3: Create reconfigurable lidar system

Literature Review

- Luminar Iris
- Ouster OS0
- Velodyne Alpha Prime
- Innoviz Innoviz360
- Quanergy M1 Lidar Sensor

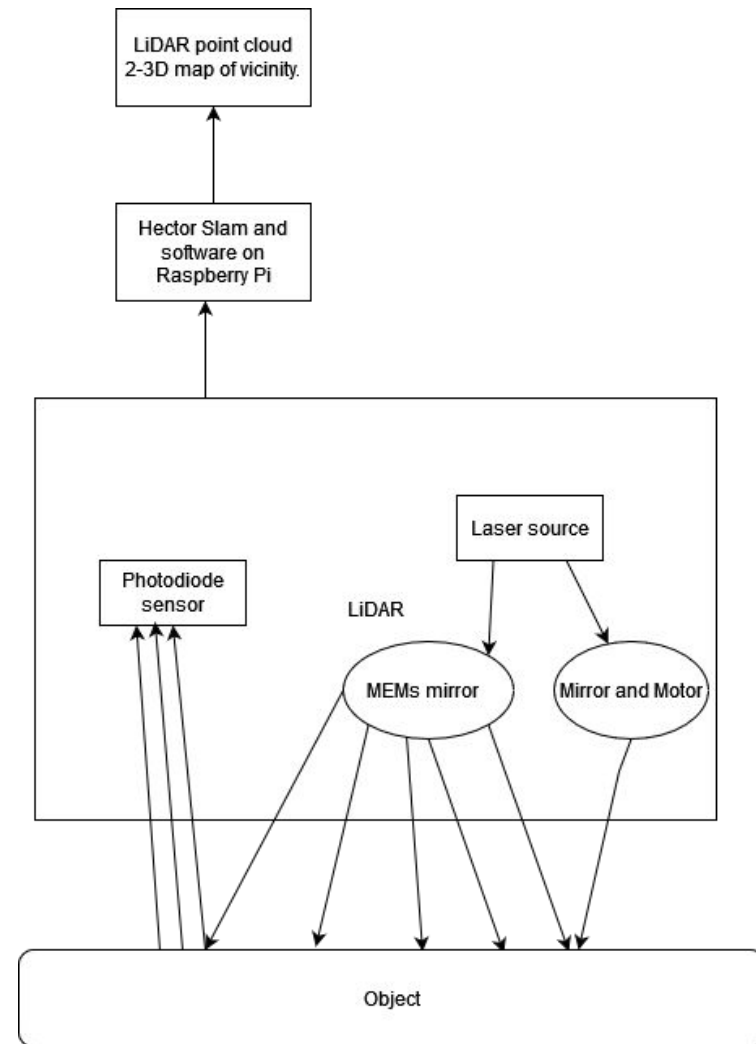


Design Constraints and Feasibility

- Time constraint: 3 months
- Bottleneck
 - Supply chain delay, longer shipping time for parts
 - Some parts out of stock, consider alternatives
 - Potential issue if parts need to be reordered
- Budget: \$600
 - Should be sufficient
- Feasibility
 - Challenging but manageable

Proposed Design

- Lidar
 - Laser source
 - Spinning mirror
 - Photodiode sensor
 - Electronic and optical components mounted on custom PCB board
- Post Processing
 - Hector SLAM/ROS to read and process lidar data
 - Generate 2d/3d point cloud



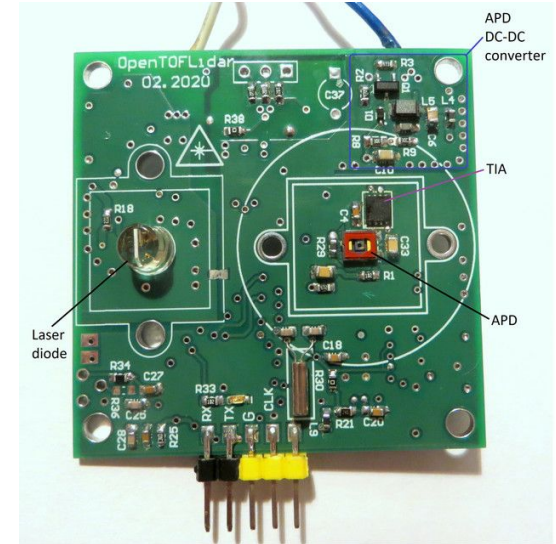
Design Validation

- Validate our model to Physical Distances
- Validate final design against Reference OpenTOF System
- Validate our Model's parameters to benchmark



Economic Analysis and Budget

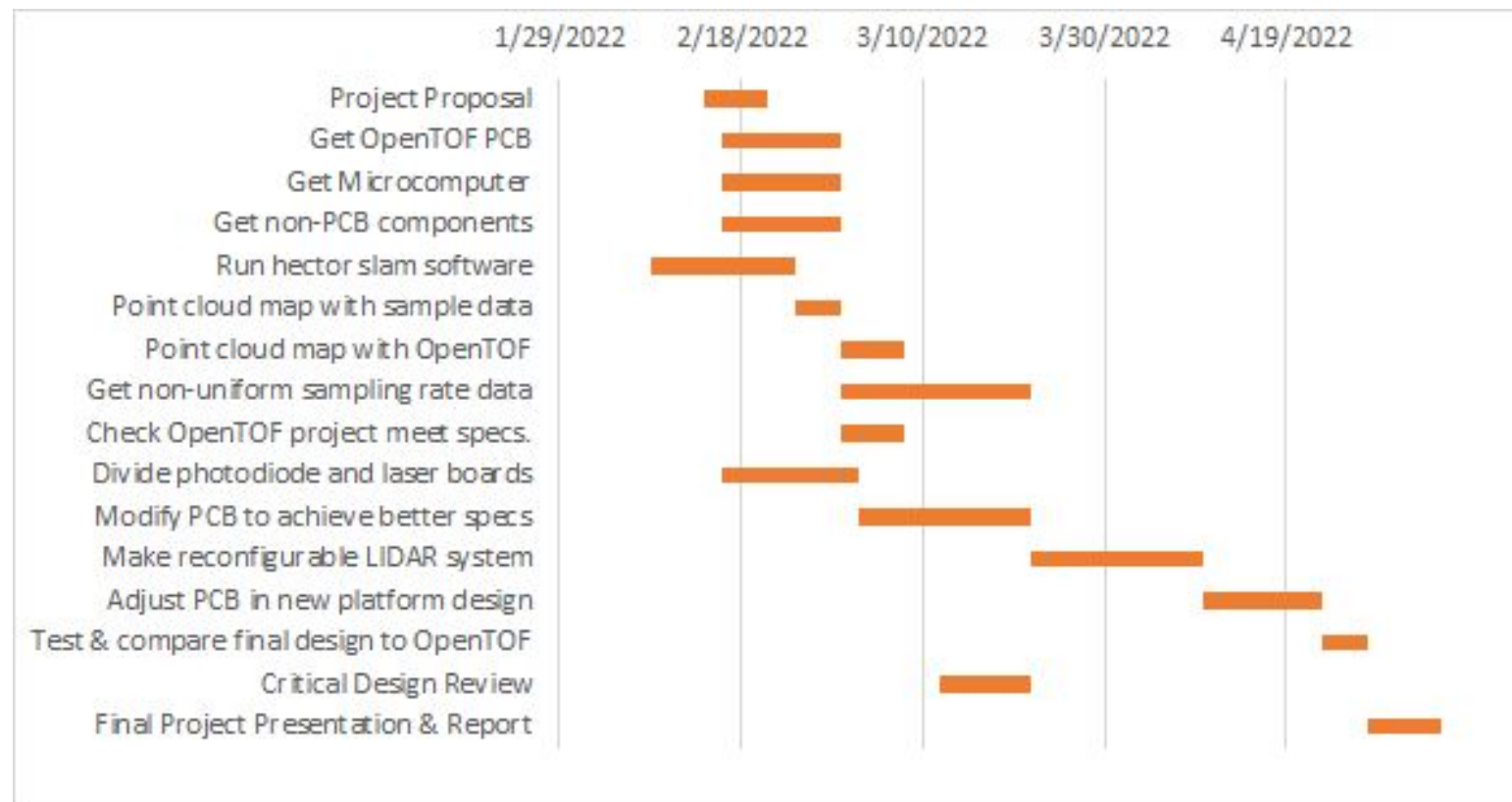
- Expensive due to supply chain
 - ~ \$100
- Explored cheaper options for certain parts
- Nvidia Jetson



Project Management and Teamwork

- Two sub-teams
- Weekly meetings and occasional Zoom meetings
- Key meeting notes and weekly meeting reports
- Github

Schedule of Tasks



Societal, Safety and Environmental Analysis

- Emerging applications in industry
- Potential harm of LiDAR laser
- Environmental issues with PCB manufacturing