

2D LIDAR MAPPING

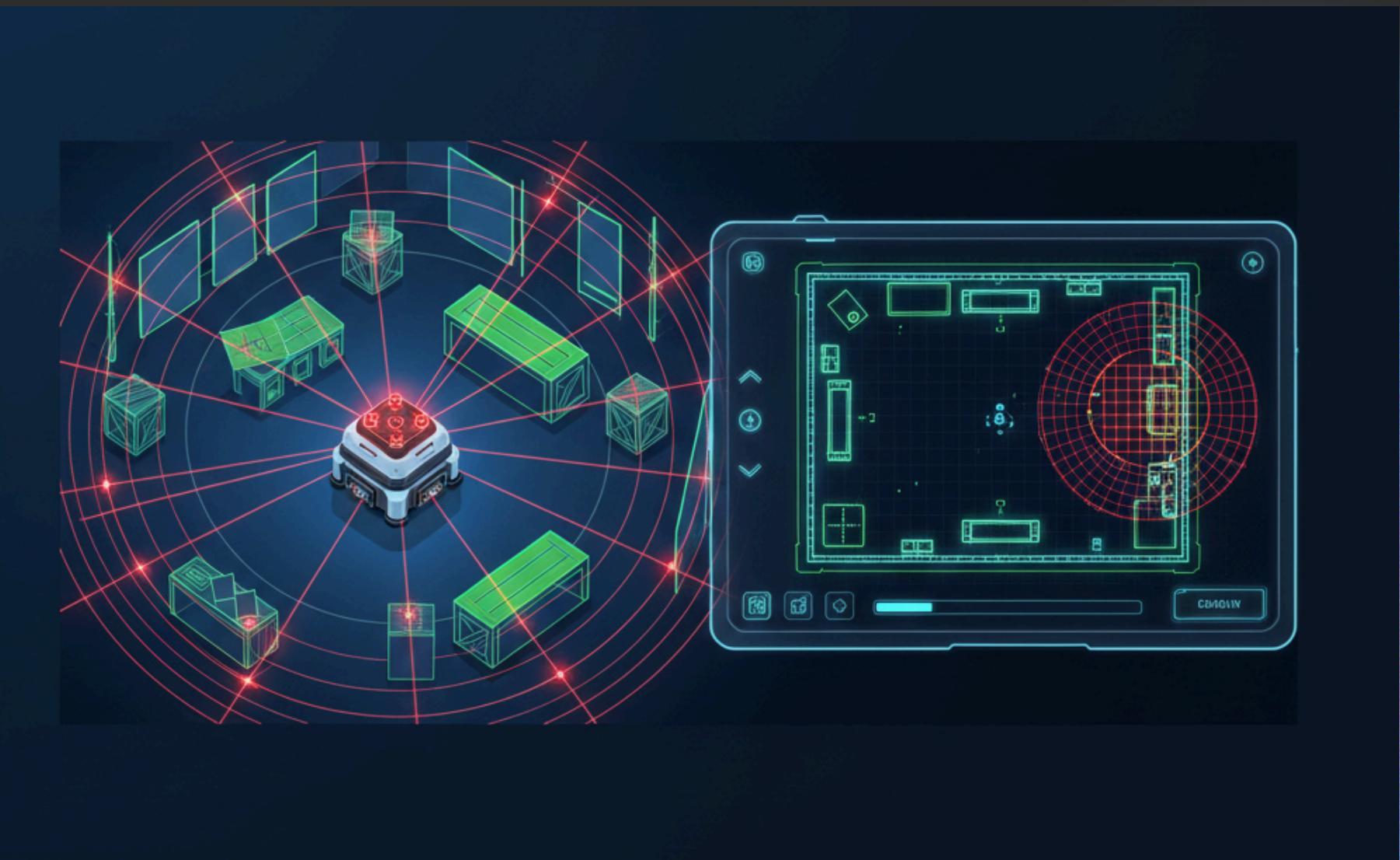
LiStars

Presented by

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PROJECT OVERVIEW

- A room-mapping system using LiDAR sensors to detect and map obstacles in real time.
- Data is processed and displayed on a 2D graphical user interface (GUI) as an overhead "map" of the environment.



PROJECT OVERVIEW

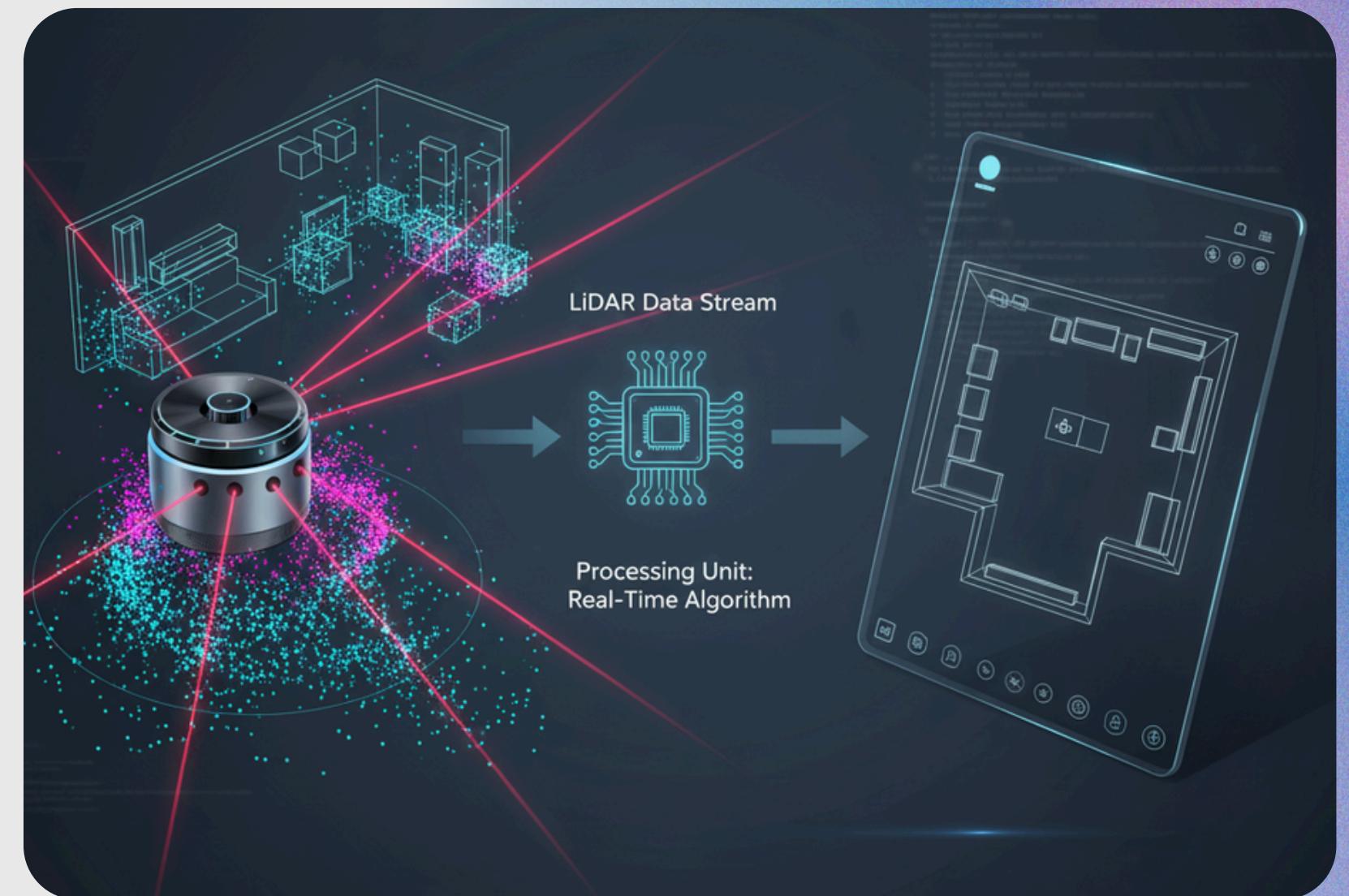
- **Initial Phase:** The system operates as a stationary or manually moved platform.
- **Later Iterations:** The platform will be motorized to autonomously navigate and continuously update the map.

3 MAIN FEATURES

1

Real-Time LiDAR Data Acquisition and Processing :

Continuously captures distance measurements from the LiDAR sensor and processes them into usable coordinate data. Enables instant obstacle detection and mapping for dynamic environments.



3 MAIN FEATURES

2

2D Map Visualization GUI:

Provides a real-time graphical interface to display scanned environments. Allows users to view, interpret, and interact with obstacle maps easily.

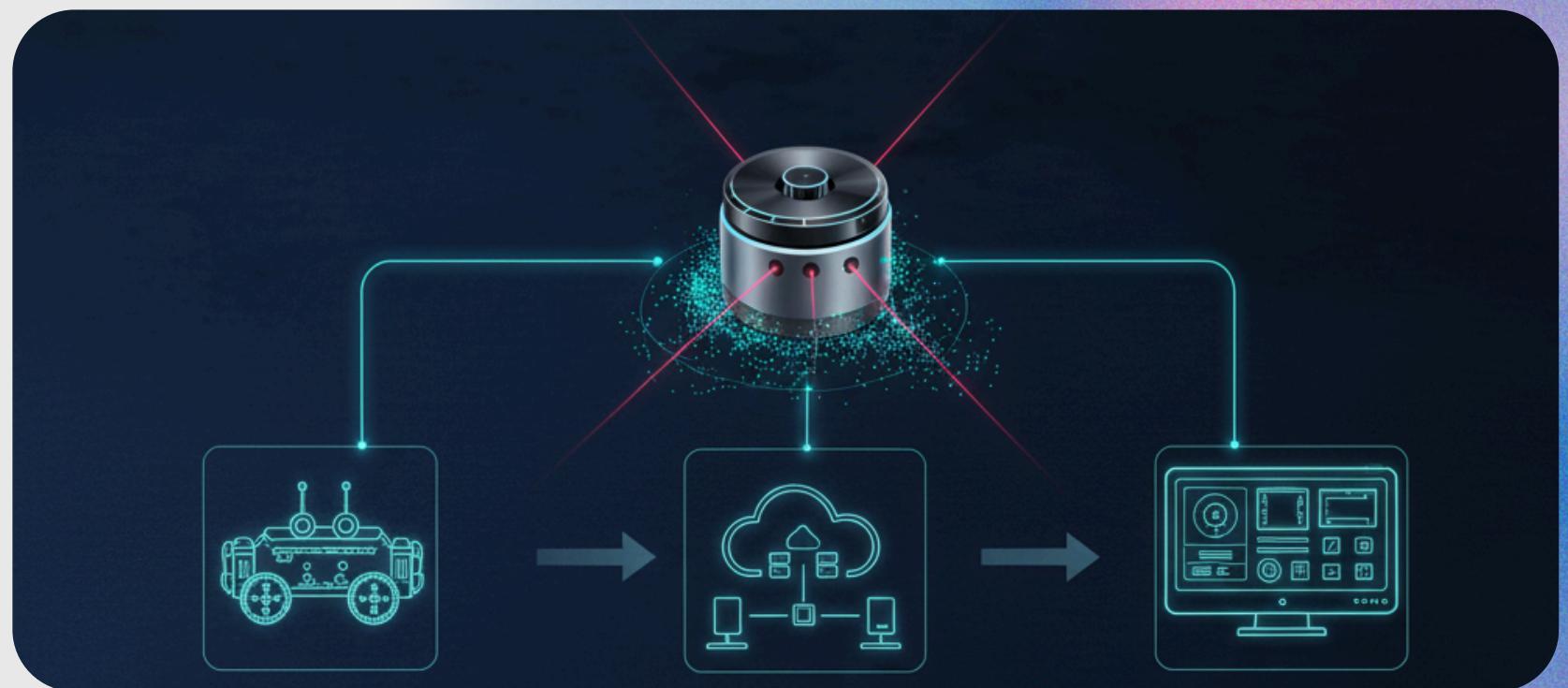


3 MAIN FEATURES

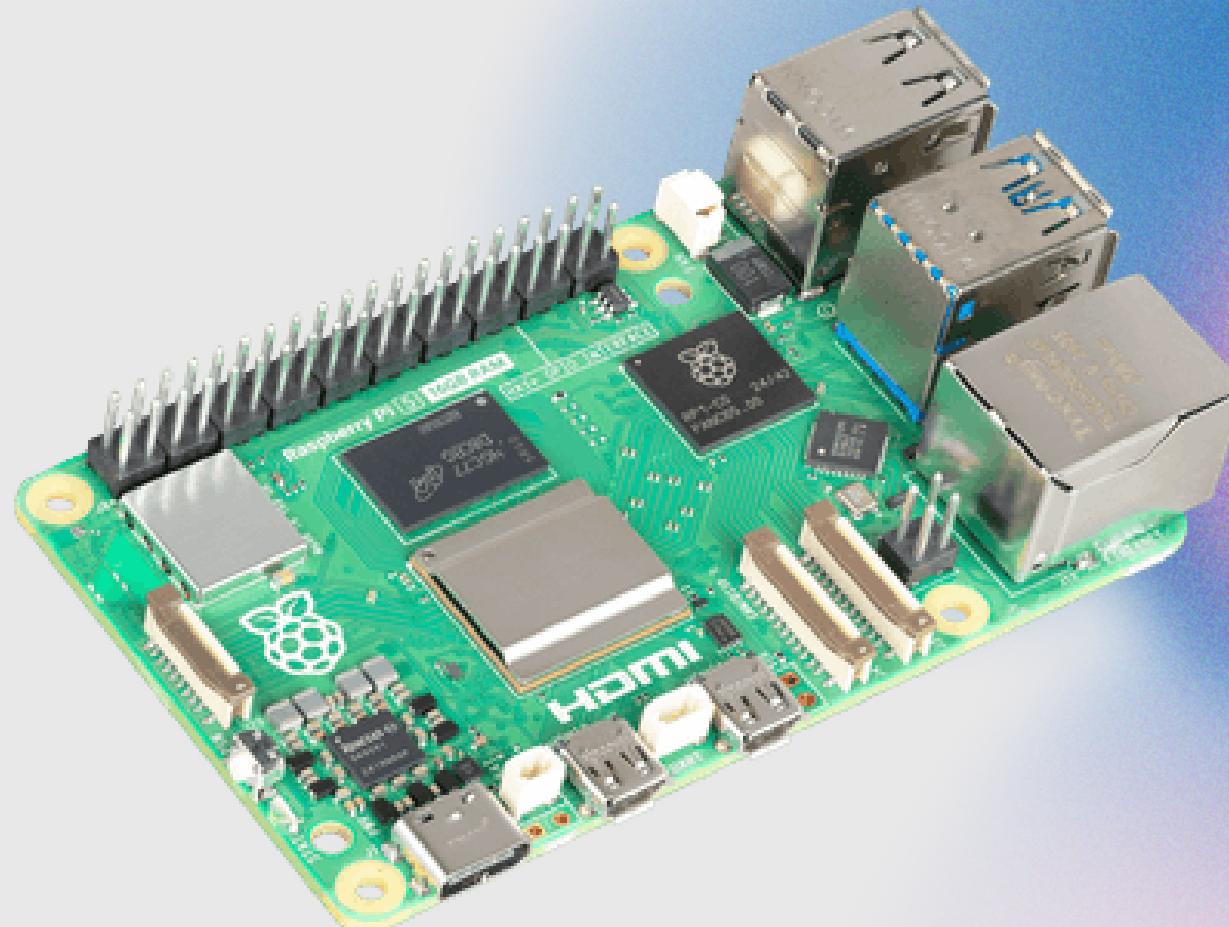
3

Compatibility with external systems:

Enables seamless data sharing with external platforms through standardized formats and protocols. Ensures integration with robotics frameworks, research tools, and custom applications.



COMPONENTS



Product Backlog

As a user, I want to be able to map obstacles in an area.



As a user, I want to be able to view obstacles in a convenient GUI



+ Add a card

**Sprint Backlog****Sprint Backlog**

≡ 1

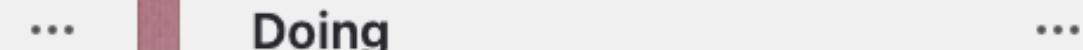
Map obstacles via LiDAR sensor

0/3

Visualize Obstacles

0/1

Assemble LiDAR sensor + motor on 3D-printed mount

**Doing**

In progress

≡ 1

Requirements

README.md

presentation

+ Add a card

**Done** 🎉

🎉 **Done**

Done

≡ 2

+ Add a card

Product Backlog

...

As a user, I want to be able to
mount the sensor on a vehicle



+ Add a card



Sprint Backlog

...

Create Mount for Sensor

0/2

Assemble LiDAR Sensor &
motor on 3D-printed mount

Maps obstacles within radius
360 degrees

Basic enclosure prototype

+ Add a card

...

Doing

...

In progress

1

Requirements

[Example task]

+ Add a card



Sprint 3 000 ▾

Product Backlog ...

As a user, I want to be able to map obstacles in an area quickly



As a user, I want to be able to map larger areas.



As a user, I want a way to export obstacle data for later reference.



+ Add a card



Sprint Backlog ...

Maps obstacles within radius 360 degrees

Move mounted sensor in a basic path



Basic enclosure prototype

Data Export (CSV)

0/1

+ Add a card



Doing ...

In progress

≡ 1

Requirements

[Example task]

+ Add a card



EXTRA WORK

Motorized + moves in preset path

Autonomous Navigation with basic pathfinding
to avoid obstacles

3-D Mapping Visualization

REQUIREMENTS GATHERING

AI (ChatGPT)
YouTube videos
Reddit threads
Brainstorming sessions where we broke down
the things we need in sequential order