



Fun Robotics: Maze Solving Robot

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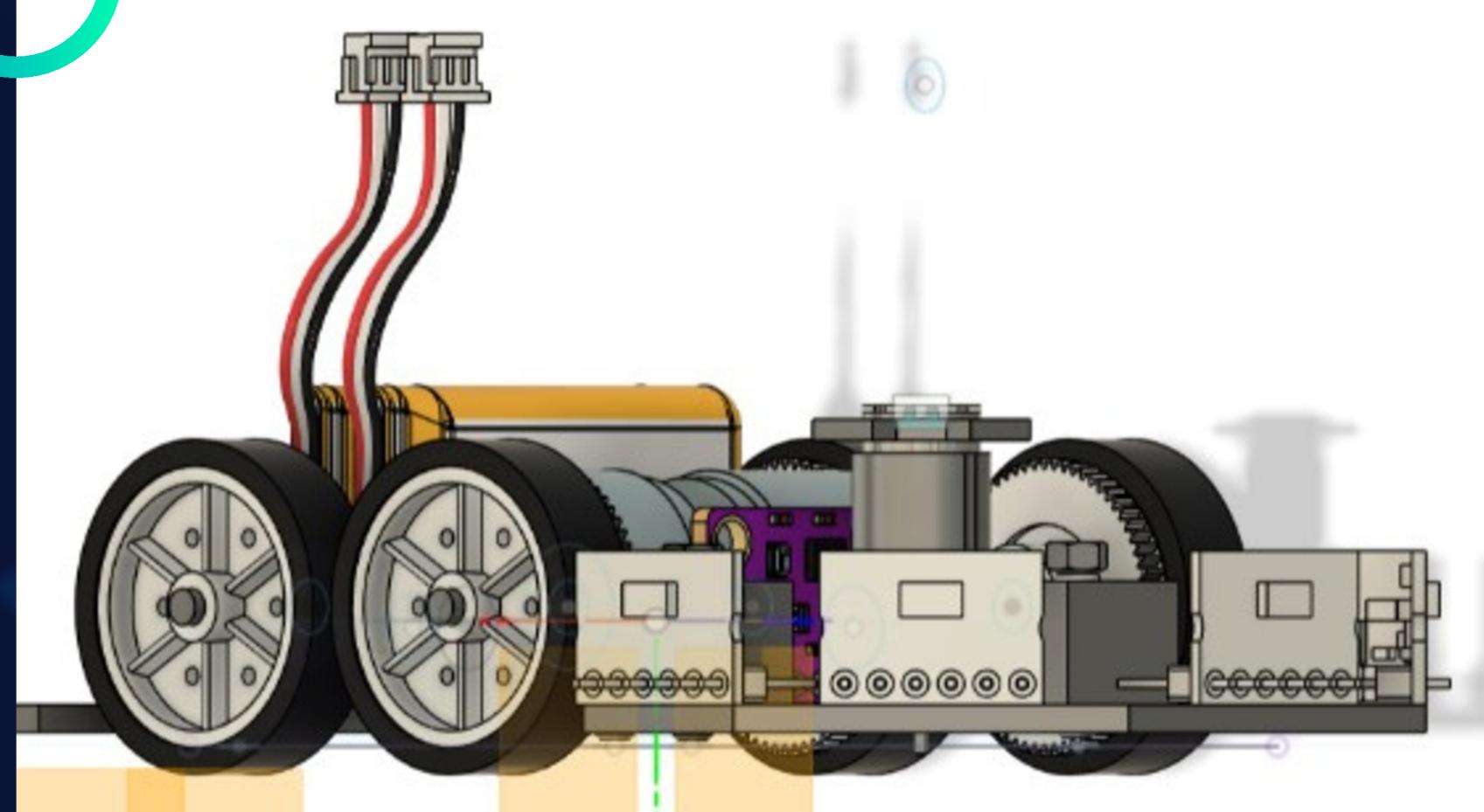
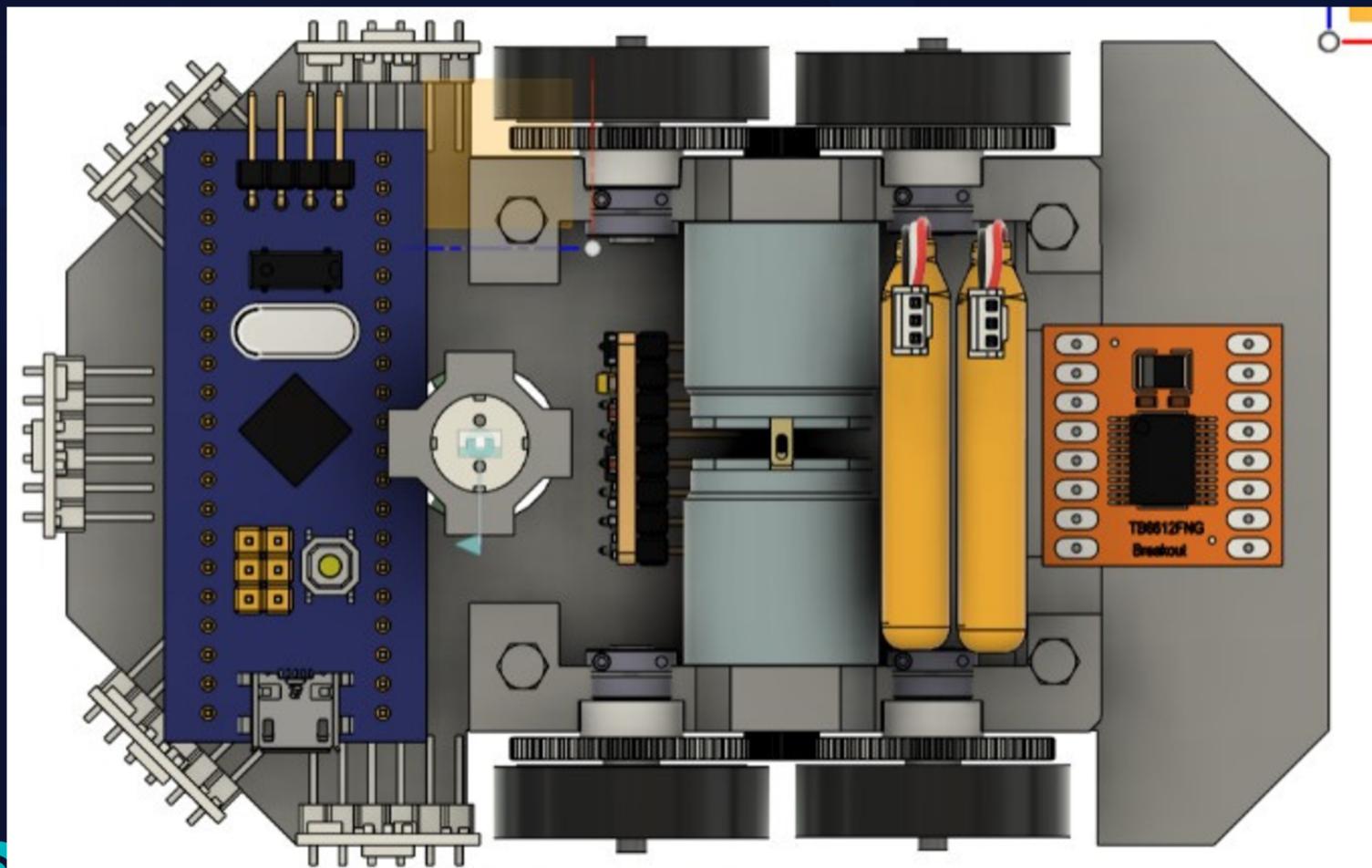
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Initial Model Proposed



Approach towards the making of initial bot

Hardware:

- LiDAR Sensors: Chosen to provide an extended sensing range, allowing the bot to detect and navigate past T-junctions in a maze more efficiently.
- Encoders: Integrated for accurate maze mapping by tracking the bot's movements and distance traveled.
- Gyroscope: Employed to offer precise feedback on the bot's orientation and stability during navigation.
- Customized PCB: Developed to reduce the complexity of wiring and ensure more stable and reliable electronic connections.

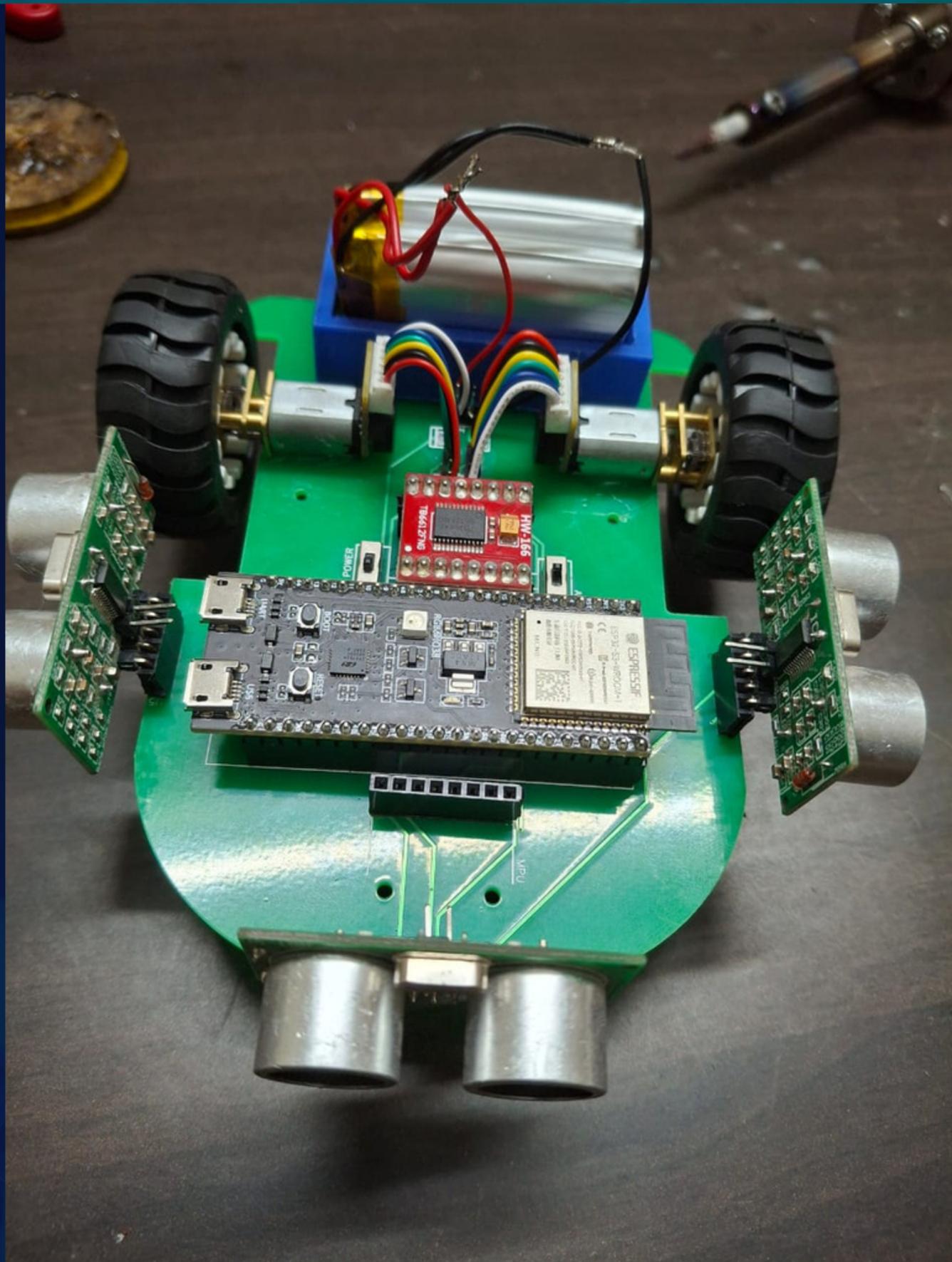
Software:

- To achieve the dual objective of discovering an unknown target and optimizing the path to it, we decided to merge two algorithms. After thorough research, we identified Tremaux for exploration and Floodfill for path optimization as the most suitable methods.



Modifications Made and Their Reasons

- Sensors changed (LiDAR to Ultrasonic)
- Correction in the design of PCB
- Decided to incorporate esp 32 without its bluetooth and wifi modules





Current Components and Advantages of Improved Hardware



- US-100 Ultrasonic Sensor Distance Measuring Module with temperature correction
- 3.7V single cell Rechargeable LiPo Battery
- N20 3V 150RPM Micro Metal Gear DC Motor With Encoder
- Self designed PCB
- Motor Driver TB6612FNG





Overview of Software Currently in Use

Currently used algorithm type:

- Obstacle avoiding

Ongoing development:

- Integrating tremaux algorithm with floodfill algorithm
- PID for smoother functionality

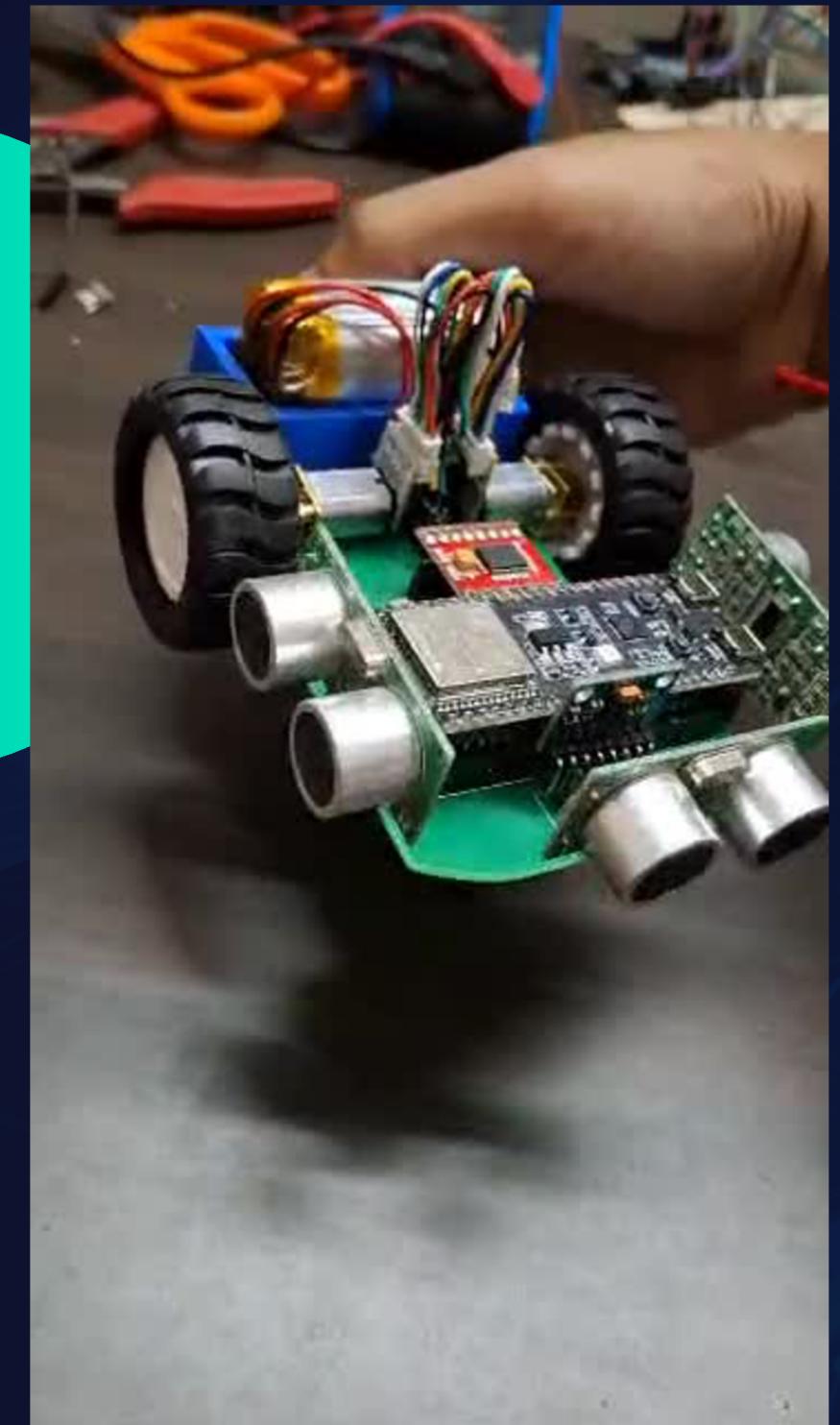


Current Progress vs. Prototyping Goals

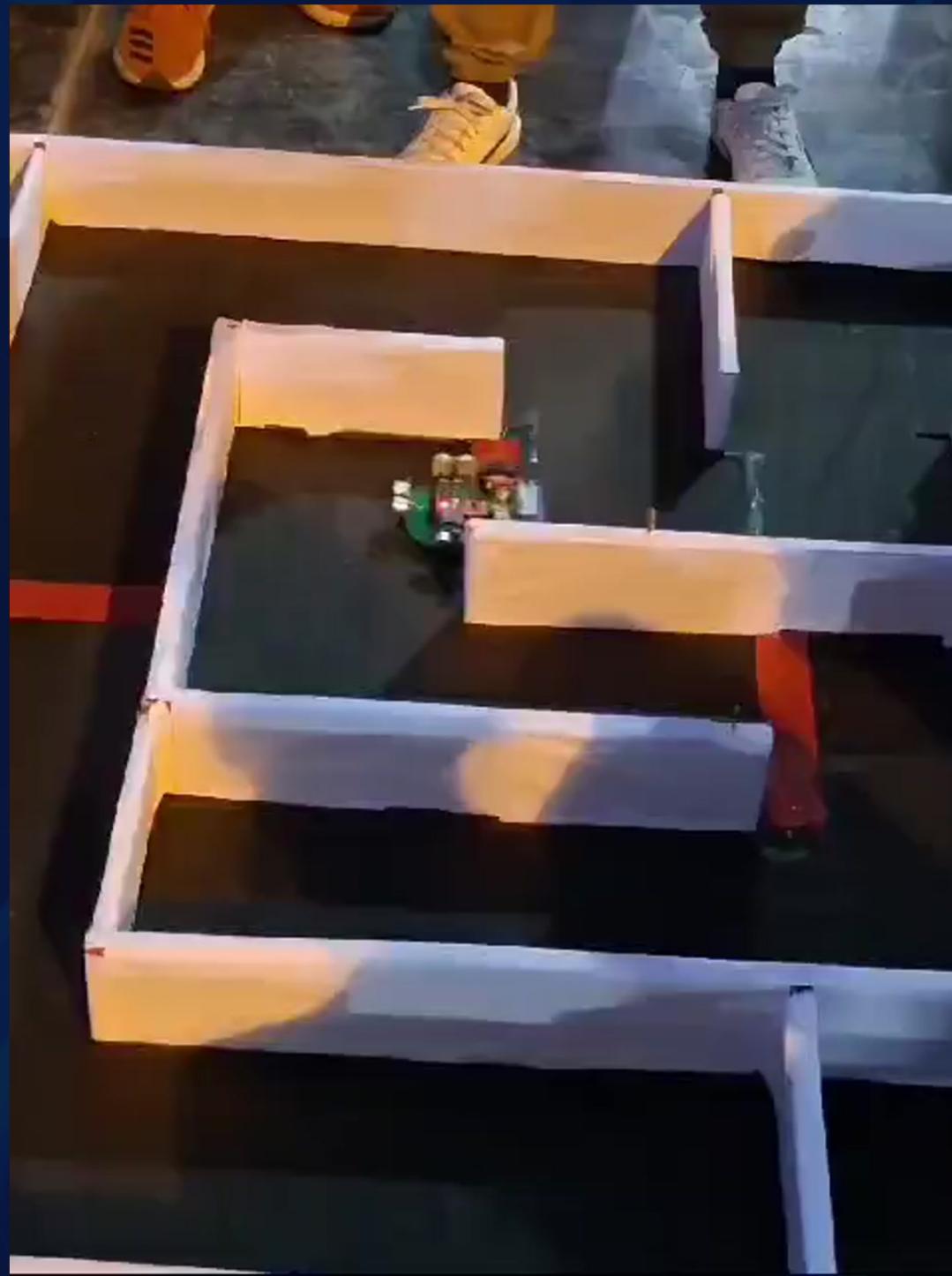
CURRENT PROGRESS	PROTOTYPING GOALS
Complete hardware designed and assembled.	Modifications to be done, if any required, for better performance.
Obstacle-avoiding algorithm used to traverse through simplistic mazes.	Integrating Flood-fill and Tremaux algorithm. Implementing PID for smoother functionality.



Our Bot's Efficiency



- Miniature size making it easier for it to access congested spaces
- Higher input accuracy of sensors
- Usage of PCB for achieving dual functions: chassis and electronic connections
- Fusion of algorithms in order to optimize the path finding process





Contact



Thank You

FOR YOUR ATTENTION

