ROBOTICS DOJO
SIMULTANEOUS LOCALIZATION AND MAPPING

AUTHORS

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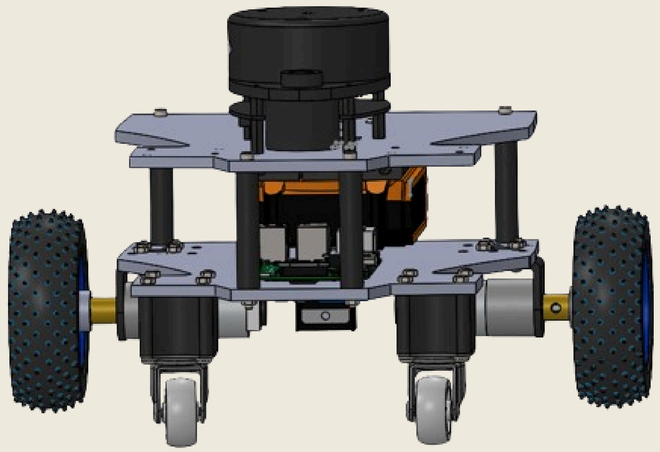
AFFILIATIONS

We're also proud of the institutions that we are with and support our research.
Centre for Development of Electronic Devices(CDED)



01. Introduction

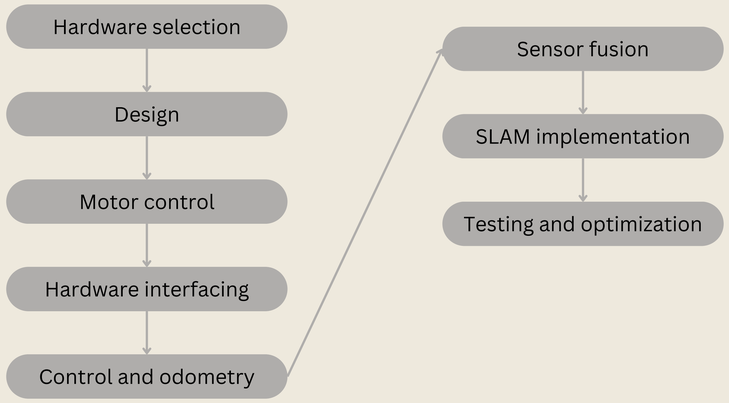
In the rapidly evolving field of robotics, navigation in unknown environments presents a significant challenge. By leveraging SLAM, We can efficiently navigate dynamic environments without the need for pre-existing maps or external localization systems. This capability is crucial for applications like search and rescue, autonomous exploration, and warehouse automation, where adaptability and real-time decision-making are paramount.

02. Objective

- Mapping and localization
- Navigating the game field while using teleoperations
- Using the Nav2 package to autonomously navigate the game field

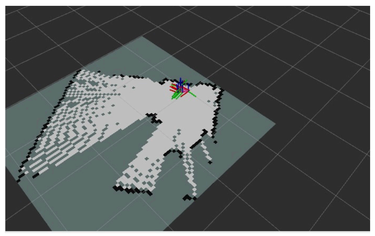
03. Methodology

We followed a series of well laid out steps as indicated below:

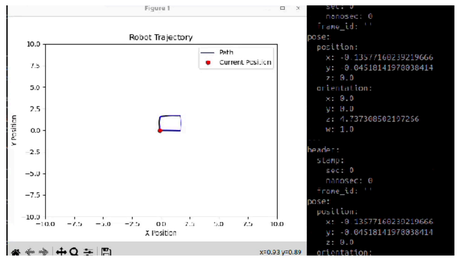


04. Results and Analysis

Expand on your findings by discussing what methods were used to analyze your data. It can get technical so keep it simple and direct to the point. Use bullets for emphasis. Include key graphs, tables, illustrations, and other images that support the study and show a visual analysis of the data. Make sure they are large enough to be seen from a distance but not clutter the poster.



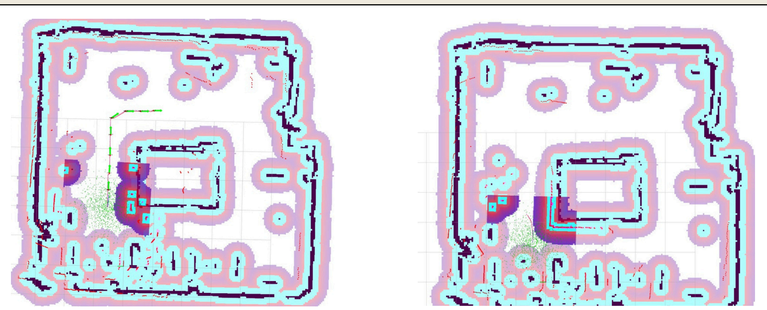
Mapping on Slamtoolbox



Odometry data analysis

05. Conclusion

As we continue to refine the robot's capabilities, future iterations will focus on enhancing the accuracy of its mapping system and improving its overall performance in more complex environments. For us this represents a significant step toward more autonomous, intelligent robotic systems, and we are confident that its development will contribute meaningfully to the future of robotics in both competitive and practical contexts.



Simultaneous Localization and Mapping on Slamtoolbox

06. References

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2. Hess, W., Kohler, D., Rapp, H., & Andor, D. (2016, May). Real-time loop closure in 2D LIDAR SLAM. In *2016 IEEE international conference on robotics and automation (ICRA)* (pp. 1271-1278). IEEE.
3. Borenstein, J., & Feng, L. (1996, April). Gyrodometry: A new method for combining data from gyros and odometry in mobile robots. In *Proceedings of IEEE International Conference on Robotics and Automation* (Vol. 1, pp. 423-428). IEEE.
4. Chong, K. S., & Kleeman, L. (1997, April). Accurate odometry and error modelling for a mobile robot. In *Proceedings of international conference on robotics and automation* (Vol. 4, pp. 2783-2788). IEEE.