

PREFACE

All gratitude and praise belong to Allah SWT for His endless mercy and blessings, which have granted the author the strength and opportunity to complete this thesis titled "**Mobile Robot Navigation Based on LiDAR Non-Visual SLAM for Wall Mapping and Human Detection.**" May peace and blessings be upon Prophet Muhammad SAW, his family, companions, and all his followers. Ameen.

The rapid development of technology today demands the use of more complex algorithms that can integrate and create higher and more complex success rates. This thesis utilizes the LiDAR A1 sensor integrated with SLAM (Simultaneous Localization and Mapping) algorithms, RANSAC, and DBSCAN, to visualize the results of the algorithm integration. The GMAPPING algorithm is used for mapping and localization, which is displayed by RViz. This method aims to demonstrate a higher level of accuracy and resolution in detecting walls, obstacles, and humans.

The author sincerely hopes that this research will provide valuable insights and contribute to the advancement of efficient LiDAR A1 sensor development. However, the author acknowledges that this work is still in its early stages, offering ample opportunities for further exploration and refinement by future researchers.

The author is also mindful of the possibility of inadvertent errors or limitations within this thesis. Therefore, any constructive feedback and suggestions from readers would be greatly appreciated to improve the overall quality of this work. In conclusion, the author hopes that this thesis will prove beneficial to those seeking to expand their understanding of LiDAR Non-Visual SLAM. It is also hoped that this research will serve as a useful reference for advancing knowledge in this area.

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