

REFERENCES

- [1] M. Spenko, E. M. Omer, and R. B. Goldman, "Trends in autonomous robotics research: A survey of advanced robotics institutes," *IEEE Access*, vol. 7, pp. 112493-112507, 2019.
- [2] J. Zhang, and S. Singh, "LOAM: Lidar Odometry and Mapping in Real-time," in *Robotics: Science and Systems (RSS)*, 2020.
- [3] H. Tian, J. Shi, J. Li, and D. Zhou, "Enhanced 3D lidar-based mapping and navigation approach for autonomous vehicles," *IEEE Access*, vol. 8, pp. 143110-143120, 2020.
- [4] X. Hu, Z. Xu, and Y. Tian, "Real-time 3D object detection from point clouds using a 2D bird's eye view," *IEEE Transactions on Intelligent Transportation Systems*, vol. 21, no. 8, pp. 3464-3473, 2020.
- [5] S. Bao, L. Zhu, X. Xu, and X. Wang, "A survey on simultaneous localization and mapping in dynamic environments," *IEEE Access*, vol. 9, pp. 107509-107523, 2021.
- [6] L. Bertino, C. A. Hernandez, and J. Peterson, "Using ROS for real-time autonomous vehicle control in challenging environments," in *2020 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 10200-10206, 2020.
- [7] A. Gupta, B. Ahmed, and A. S. Das, "Implementation of real-time embedded systems for autonomous navigation using Raspberry Pi," *IEEE Access*, vol. 9, pp. 70415-70425, 2021.
- [8] K. Lee, S. Park, and J. Kwon, "Efficient data communication for autonomous mobile robots using Raspberry Pi 4," *IEEE Transactions on Industrial Informatics*, vol. 16, no. 11, pp. 7058-7065, 2020.
- [9] W. Norzam, H. Hawari, and K. Kamarudin, "Analysis of mobile robot indoor mapping using gmapping based slam with different parameter," in *IOP Conference Series: Materials Science and Engineering*, vol. 705, no. 1. IOP Publishing, 2019, p. 012037.

- [10] Y. Wang, L. Zhang, and J. Zhao, "High precision control of DC motors using Arduino and sensors," in 2021 IEEE International Conference on Industrial Electronics for Sustainable Energy Systems (IESES), pp. 456-461, 2021.
- [11] S. Ahmed, T. K. Islam, and H. Rahman, "Design of a low-cost motor driver using Arduino for small-scale robotics," IEEE Access, vol. 8, pp. 104892-104899, 2020.
- [12] A. Y. Zhuang, M. S. Alsharif, and S. M. Sameh, "A novel design of motor driver circuit for mobile robot control," IEEE Access, vol. 9, pp. 143400-143412, 2021.
- [13] J. Wilson, R. Chavez, and D. Richardson, "Design and analysis of a tank chassis for autonomous robots in rugged terrain," IEEE Access, vol. 9, pp. 75912-75921, 2021.
- [14] Y. Li, X. Wu, and Y. Zhang, "Enhancing maneuverability of tank robots in rough environments using adaptive control algorithms," IEEE Access, vol. 9, pp. 13014-13025, 2021.
- [15] H. Nguyen, M. A. Rassam, and T. Sun, "Systematic design approach for autonomous mobile robots using multi-sensor integration," IEEE Transactions on Robotics, vol. 36, no. 2, pp. 470-484, 2020.
- [16] W. Song, J. P. Aboytes, and R. Soto, "Real-time data processing and control for autonomous mobile robots using Raspberry Pi and ROS," IEEE Access, vol. 8, pp. 121523-121531, 2020.
- [17] F. Khan, S. Shafique, and R. Mahmood, "Achieving low-latency communication in autonomous robotic systems using advanced communication protocols," IEEE Transactions on Industrial Electronics, vol. 68, no. 5, pp. 4012-4022, 2021.
- [18] R. Patel, B. Singh, and P. Jain, "Optimization of SLAM algorithms for real-time mobile robots using deep learning techniques," IEEE Access, vol. 8, pp. 193250-193260, 2020.
- [19] J. K. Lee, S. Park, and H. Shin, "Developing and testing robust SLAM systems for autonomous navigation in complex environments," in 2021

- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 10350-10357, 2021.
- [20] A. R. Villalobos, and R. C. De la Cruz, "Design and implementation of autonomous robotic systems for hazardous environments," IEEE Transactions on Robotics, vol. 37, no. 3, pp. 867-878, 2021.
 - [21] Macenski, S., et al., "Evolution of robotic frameworks: From ROS 1 to ROS 2," Robotics and Automation Magazine, 2020.
 - [22] Stachniss, C., et al., "FastSLAM: An efficient solution for SLAM," Robotics and Autonomous Systems, 2005.
 - [23] Zhang, J., & Singh, S., "LOAM: Lidar Odometry and Mapping," Robotics: Science and Systems, 2014.
 - [24] Grisetti, G., et al., "Improved techniques for grid mapping," IEEE Transactions on Robotics, 2007.
 - [25] Schubert, E., et al., "DBSCAN revisited: Improvements in density-based clustering," Data Mining and Knowledge Discovery, 2017.
 - [26] S. Lee, S. An, J. Kim, H. Namkung, J. Park, R. Kim, and S. E. Lee, "Grid-Based DBSCAN Clustering Accelerator for LiDAR's Point Cloud," Electronics, vol. 13, no. 17, p. 3395, Aug. 2024.
 - [27] Fischler, M. A., & Bolles, R. C., "Random sample consensus," Communications of the ACM, 1981.
 - [28] Raguram, R., et al., "Robust estimation with RANSAC," Computer Vision and Image Understanding, 2008.
 - [29] Barath, D., et al., "Progressive sample consensus," IEEE Transactions on Pattern Analysis and Machine Intelligence, 2018.
 - [30] G. Yang, Y. Yu, Q. Huang, et al., "Survey of Robotics and Unmanned Aerial Vehicles for Transportation Studies," Journal of Advanced Transportation, vol. 1, pp. 4-12, 2017.
 - [31] Z. Ibrahim and J. He, "SLAM Technology on Disaster Response," World Journal of Engineering and Technology, vol. 12, pp. 695-714, 2024.