

Enhancing Autonomy of Mobile Robots with Behavioral Tree using ROS2

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Abstract—This paper proposes a behavioral planning approach to improve the autonomy of mobile robots using the Robot Operating System (ROS2). The study aims to address the issue of human intervention that is often required during the operation of autonomous mobile robots. The system includes a monitoring system, sensor data storage, and behavior tree design and implementation. The effectiveness of the approach was evaluated using the Gazebo simulator, with the behavior tree handling various scenarios such as sensor failures, collisions, unreachable goals, and low battery state. The simulation results showed a significant improvement in the robot's autonomy and resilience to failures. Additional validation is being performed through real-world experiments to confirm the results.

I. INTRODUCTION

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II. RELATED WORK

III. PROPOSED APPROACH

IV. EXPERIMENTAL WORK

V. RESULTS AND DISCUSSION

VI. CONCLUSION AND FUTURE RECOMMENDATIONS

REFERENCES

- [1] M. Quigley, K. Conley, B. Gerkey, J. Faust, T. Foote, J. Leibs, R. Wheeler, A. Y. Ng *et al.*, "ROS: an open-source robot operating system," in *ICRA workshop on open source software*, vol. 3, no. 3.2. Kobe, Japan, 2009, p. 5.



Fig. 1: Figure Caption

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