

TASK 1: Research Report on Service Robots

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Abstract

This research report discusses the growing importance of service robots in modern society. Service robots assist humans in healthcare, agriculture, defense, hospitality, and domestic environments. The report explains their technologies, applications, benefits, challenges, and future scope.

Introduction

Service robots are autonomous or semi-autonomous systems designed to perform useful tasks outside industrial manufacturing. With the integration of Artificial Intelligence and advanced sensor systems, these robots are becoming more intelligent and adaptive.

Applications

Service robots are used in healthcare for surgeries and rehabilitation, in agriculture for automated harvesting, in defense for surveillance and bomb disposal, and in hospitality for customer assistance. Domestic robots support elderly care and home automation.

Core Technologies

Service robots integrate sensors such as cameras and LIDAR, actuators like servo motors, embedded control systems, and AI algorithms for navigation and decision-making.

Advantages and Challenges

Advantages include improved efficiency, 24/7 operation, and enhanced safety. Challenges include high cost, privacy concerns, safety validation, and energy limitations.

Future Scope

Future trends include deeper AI integration, IoT connectivity, collaborative robots, and emotionally intelligent service systems.

Conclusion

Service robots are transforming the way humans live and work. Continued advancements in robotics and AI will expand their adoption globally.