

PERSONAL ROBOTIC ASSISTANT BASED ON AI VISION AND LANGUAGE UNDERSTANDING

Elevator Pitch

Enhance productivity and streamline daily operations with our cutting-edge Personal Robotic Assistant. Designed for diverse environments like law offices, hotels, and event spaces, this robot features advanced AI for language understanding and visual recognition, efficient navigation, and precise task handling. Economically beneficial and environmentally friendly, our robotic assistant transforms workplaces by automating routine tasks and supporting sustainable practices.

Objective

The project's objective is to develop a Personal Robotic Assistant that enhances productivity and quality of life by performing various tasks, from scheduling to physical manipulation. It features advanced mobility, precise manipulation, and integrated AI for natural language processing and object recognition. The robot is designed to operate effectively in office and home environments, emphasizing user-friendly interaction, safety, and efficiency within budget constraints.

Problem Statement

In modern settings, individuals and organizations often struggle with time management and efficiency due to routine and complex tasks that demand substantial human effort. There is a need for an autonomous solution that can efficiently handle diverse tasks in various environments, enhancing productivity without continuous human input.

Project Impact

Economic Impact Our Personal Robotic Assistant (PRA) enhances office efficiency, reduces costs and stimulates tech sector employment and AI investment.

Social Impact The PRA improves workplace dynamics by automating mundane tasks, boosting creativity, and necessitating workforce retraining and strict data privacy measures.

Environmental Impact Our PRA is built with sustainable materials and technologies, focusing on reducing waste and promoting recycling to support long-term ecological health.

Target Specification



Weight: it needs to handle at least a weight of 10kg



Speed and Mobility: Up to 0.3 meters/second



Manipulation Accuracy: Handle objects as small as 2 cm, gripping force up to 5 Newtons, able to lift 1 kg objects



Battery Life: Minimum 20 minutes under continuous operation

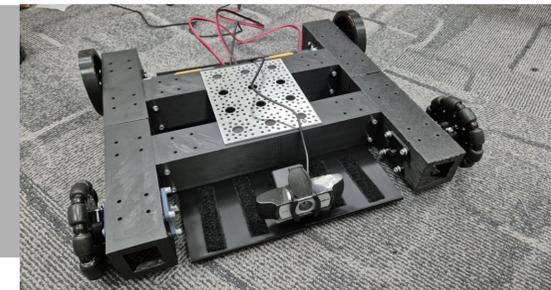
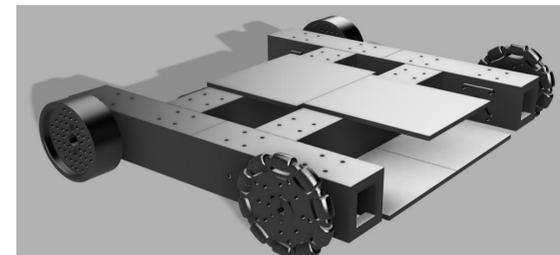


Object Recognition and Processing Time: Identify objects within 1 seconds, with 85% threshold.

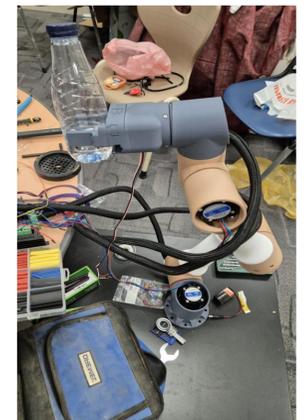
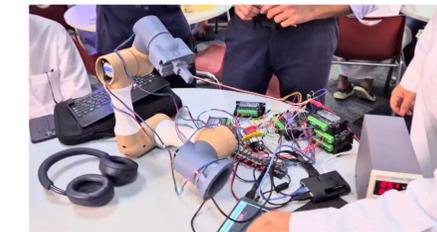
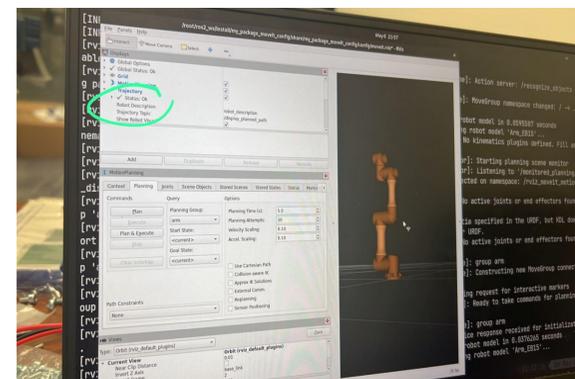


Voice Command Response Time: Respond within 5 seconds

Prototype Design



Test / Validation



Constraints

Constraint	Impact
Limited Budget	affects the material we use which creates more constrains such as the other two
Manipulation Movement	The Robot arm is designed for low budget, so it does not have fingers which limit it from grabbing some items
AI Interaction	The AI can recognize some gestures and voice commands as not intended.