

Visionary BOT: An AI-Based Vision Assistant

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Abstract: *With the rapid growth of digital work environments and prolonged screen usage, individuals increasingly face issues such as poor posture, mental fatigue, irregular routines, and reduced physical activity. Existing solutions often focus on isolated aspects of wellbeing and lack an integrated, interactive system capable of providing real-time assistance. This paper presents Visionary Bot, an AI-based smart robotic assistant designed to promote healthy work habits and improve daily productivity through continuous visual monitoring and intelligent feedback.*

The proposed system combines computer vision, deep learning, and embedded robotics to monitor user posture, detect emotional states, recognize food habits, and provide timely reminders for hydration, breaks, and routine management. Implemented using a Raspberry Pi 4B with a camera module, microphone, speaker, dual OLED displays acting as expressive robotic eyes, and MG90 servo motors for dynamic head movement, the system automatically aligns with the user. Lightweight deep learning models such as MediaPipe and CNN-based classifiers enable real-time processing on edge hardware.

Visionary Bot enhances human-computer interaction by physically tracking users, delivering voice-based feedback, and visually expressing responses, creating an engaging intelligent assistant. Experimental implementation shows the system effectively supports wellness monitoring while remaining affordable and compact, demonstrating the potential of AI-driven embedded robotic assistants in improving lifestyle management in educational, professional, and home environments..

Keywords: Computer Vision, Deep Learning, Embedded Systems, Human-Robot Interaction, Posture Detection, AI Assistant

