

ABSTRACT

The interactive robot was developed as an innovative solution to support the delivery of information to visitors at the Tea and Cinchona Research Center (PPTK) in Gambung. In an era of rapid digital advancement, the need for efficient and interactive information services is increasingly vital, especially in educational and research-based tourism destinations like PPTK. This robot is expected to provide both an interactive and educational experience to visitors through voice and motion-based technology.

This study focuses on the development of an interactive robot consisting of two main components: hardware and software. The hardware includes a Raspberry Pi 4 Model B with 4GB RAM as the core system for the Voicebot, and an Arduino Nano that controls the robot arm using servo motors triggered by touch sensors. On the software side, the Voicebot features speech-to-text conversion, keyword matching using Cosine Similarity on embedding files, and text-to-speech conversion to deliver responses. The system operates in a question-and-answer (QnA) format, where users can ask verbal questions and receive direct answers from the robot.

The results show that applying the Cosine Similarity method to Embedding Files effectively identifies and matches verbal questions accurately, enabling the system to provide relevant and precise answers. The interactive robot successfully functions as an effective medium for conveying information to PPTK Gambung visitors. Therefore, this robot not only enhances the quality of information services but also strengthens the integration of technology in the education and tourism sectors.

Keywords: interactive robot, Raspberry Pi, Arduino Nano, Cosine Similarity, Embeddings File, Voicebot