A novel and refined contactless user feedback System for immediate on-site response collection

ABSTRACT

This paper introduces a Contactless User Feedback System (CUFS) that provides an innovative solution for capturing user feedback through hand gestures. It comprises a User Feedback Device (UFD), a mobile application, and a cloud database. The CUFS operates through a structured sequence, guiding users through a series of questions displayed on an LCD. Using the Pi Camera V2 for contactless hand shape capture, users can express feedback through recognized hand signs. A live video feed enhances user accuracy, while secure data transmission to a database ensures comprehensive feedback collection, including timestamp, date, location, and a unique identifier. A mobile application offers real-time oversight for administrators, presenting facility status insights, data validation outcomes, and customization options for predefined feedback categories. This study also identifies and strategically addresses challenges in image quality, responsiveness, and data validation to enhance the CUFS's overall performance. Innovations include optimized lighting for superior image quality, a parallel multi-threading approach for improved responsiveness, and a data validation mechanism on the server side. The refined CUFS demonstrates recognition accuracies consistently surpassing 93%, validating the effectiveness of these improvements. This paper presents a novel and refined CUFS that combines hardware and software components, contributing significantly to the advancement of contactless human-computer interaction and Internet of Thingsbased systems.