ABSTRACT

This project aims to develop a real-time ArUco marker detection and tracking system using a Raspberry Pi and the OpenCV library. ArUco markers are visual fiducials that are specifically designed for computer vision applications and offer a reliable and cost-effective solution for object detection and tracking. Aruco markers are a type of fiducial marker that can be used for Augmented Reality (AR) applications. The system will use a camera to capture images of the environment, and then use OpenCV to detect any Aruco markers that are present. Once a marker has been detected, the system will calculate its pose, which is its location and orientation in 3D space. This information can then be used to overlay AR content onto the real-world environment.

The system will be evaluated by measuring its accuracy in detecting Aruco markers and calculating their pose. The system will also be evaluated by its ability to overlay AR content onto the real-world environment in a realistic and engaging way.

The system will be a valuable tool for researchers and developers who are working on AR applications. It will also be a fun and educational project for students and hobbyists.

In addition to real-time visualization, the system will provide information about the detected markers, including their IDs and their positions in real-world coordinates. These data can be utilized for various applications, such as augmented reality, robotics navigation, and motion tracking.

By employing ArUco markers and harnessing the power of a Raspberry Pi and OpenCV, this project aims to establish a cost-effective, efficient, and versatile solution for object detection and tracking. The system's capabilities and ease of implementation make it suitable for a wide range of applications, offering a valuable tool for researchers, developers, and end-users alike.

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