

## Script Reader for Visually Impaired People

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### Abstract:

This paper presents a Raspberry Pi-based assistive system designed for visually impaired individuals, enabling both text-to-Braille conversion and image description. The system utilizes computer vision with ArUco marker detection to identify the presence of a document or object in the camera frame. Once a document is detected, Optical Character Recognition (OCR) is employed to extract the text from the image. The extracted text is then displayed on an LCD screen for reference and translated into Braille patterns. A set of six solenoids connected via solenoid drivers to the Raspberry Pi simulate the corresponding Braille dots in real-time, allowing the user to read the content through tactile feedback. This tactile output dynamically shifts to represent the next character, thereby facilitating a line-by-line Braille reading experience.

In an alternate mode, the system functions as an intelligent visual scene describer. When an image without recognizable text is shown to the camera, the system switches to object and scene recognition using an AI-based image captioning API. The generated description is converted into speech using a text-to-speech engine and played through speakers, giving the user auditory feedback about the visual context. This dual-mode setup enhances accessibility by providing both reading and environmental awareness functionalities. The device is portable, cost-effective, and designed for low-power embedded deployment, making it suitable for real-world assistive applications.

### Keywords:

Raspberry Pi, OCR, Artificial intelligence, API.