E-Vision: Helping the Blind Experience the World Again

Tan, Jun Ren (School: Sekolah Menengah Jenis Kebangsaan Jit Sin)

Visual impairment limits access to printed information, environmental awareness and timely assistance, especially for students and individuals who rely heavily on Braille or caregivers. To address these challenges, e-Vision was developed as an AI-powered assistive wearable device that converts visual input into real-time audio feedback. The system is designed to support independent learning, daily navigation and personal safety for visually impaired users. e-Vision integrates a Raspberry Pi Zero 2W, Camera Module V3, tactile input buttons and audio output within a lightweight 3D-printed casing refined for comfort and usability. Using Optical Character Recognition (OCR) and computer vision powered by AI, the device reads printed text aloud and identifies surrounding objects or scenes on demand. An emergency feature allows users to trigger a buzzer and send an alert to a trusted contact through Telegram. A built-in battery status check provides spoken feedback to support safe and continuous use. The prototype was developed through a thoughtful engineering process involving hardware integration, software development and field testing with visually impaired students and educators. Feedback from users guided improvements in casing balance, button placement and text recognition accuracy, especially for small fonts commonly found in textbooks. e-Vision demonstrates how applied STEM knowledge can be used to create practical assistive technology that reduces dependence on others, improves access to education and enhances personal safety. The project supports inclusive design principles and shows strong potential for real-world deployment as an affordable solution for the visually impaired community.

Awards Won:
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: Full Scholarship from King Fahd University of Petroleum and Minerals(KFUPM) (and a $400 cash prize)
King Abdulaziz &amp
his Companions Foundation for Giftedness and Creativity: NOT TO BE READ -- $400 cash prize for each Full Scholarship from King Fahd University award recipient