

ABSTRACT

Color vision is an important aspect of daily life, affecting aesthetics, communication, and information delivery. However, around 8 of men and 0.5 of women in the world have Color Vision Deficiency (CVD) or color blindness, which has a significant impact on daily activities such as choosing clothes, reading maps, and technical work. This final project discusses the types of CVD, primary and secondary causes, and the challenges faced by sufferers in social, economic, technological, health, and educational aspects. Existing solutions such as EnChroma glasses and color blind contact lenses are analyzed for their advantages and limitations. This final project proposes the development of technology-based aids, such as mobile applications, special glasses, and Raspberry Pi-based tools, designed to improve the independence and quality of life of people with CVD. The evaluation of solutions was conducted using a score matrix based on the criteria of color detection function, ease of use, portability, accuracy, adaptability to different types of CVD, availability of additional features, and price. The analysis results show that mobile applications with color filters are the best solution, supported by development using the Flutter framework and YOLOv5/YOLOv8 deep learning-based detection methods. This final project is expected to encourage technological innovation that is more inclusive for people with CVD.

Keyword: Color Blindness, Color Detection, Deep Learning, Flutter, Mobile Application