

ABLEapp: An Accessibility Analyser

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Abstract

The ABLE App (AI-Powered Accessibility App) is an Android-based solution developed to address the challenge of limited smartphone accessibility for individuals with disabilities, which often restricts their ability to interact effectively with digital content. The primary objective of this study is to design and implement an inclusive mobile application that integrates multiple assistive technologies into a unified platform to enhance usability and user independence. The system incorporates key features such as Text-to-Speech (TTS), Speech-to-Text (STT), Optical Character Recognition (OCR) for real-world text extraction, a dyslexia-friendly reading mode, and a colour assistant to support users with colour vision deficiencies. Additional accessibility functionalities include font scaling, high-contrast display modes, and voice-based navigation. The application processes inputs from speech, images, and web URLs, converting them into accessible readable or audible formats while storing relevant data locally using SQLite for efficient retrieval. The app is developed using Kotlin, Jetpack Compose, Google ML Kit, and Android Speech APIs to ensure real-time performance and reliability. Evaluation of the system is conducted based on OCR accuracy, speech recognition performance, latency, and application stability. The results demonstrate that the proposed solution significantly improves accessibility and user interaction. This study highlights the potential of artificial intelligence and mobile technologies in creating inclusive digital solutions that contribute to equal access for all users.

Index Terms

Accessibility, Android, OCR, Speech, AI, Assistive Technology