Dots to Dialogue: Enhancing Accessibility through Braille Image-to-Speech Conversion

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Abstract : Braille script holds significant importance in bridging the communication gap for visually impaired individuals. However, the challenge of interpreting Braille for non-experts creates barriers in education and day-to-day interactions. This paper aims to develop a system that translates Braille text into multilingual speech using advanced Convolutional Neural Networks (CNNs) and Google Text-to-Speech (GTTS) technology. The proposed system employs image recognition techniques powered by CNNs to accurately identify and decode Braille characters from captured images. The deep learning model undergoes training on a diverse dataset of Braille symbols to ensure high accuracy and robustness. Among the models evaluated, AlexNet demonstrated the highest accuracy in decoding Braille characters. Once recognized, the decoded text is converted into speech in the user's preferred language using the GTTS API. This system possesses the ability to greatly improve inclusivity by enabling real-time Braille interpretation for visually impaired individuals, educators, and caregivers.