Autoreader: A Wearable Assistant for the Visually Impaired

Bhople, Aditya

According to the World Health Organization (WHO) estimates, there are about 285 million visually impaired people in the world. They face many problems in their day to day life; the major one faced by them is the disability to procure information from text sources. I have come up with a wearable assistant, which utilizes technologies like Optical Character Recognition (OCR), Text To Speech (TTS) and image analysis algorithm for field recognition to read out printed text to the visually impaired. The device has been developed around a 32-bit ARM CPU clocked at 1 GHz supported by 512 MB of RAM. The device runs the host operating system of Debian Linux. The device does not require any internet or network connection to recognize the printed text in-front of the user and synthesize it into speech. The early prototype of the device utilized Radio Frequency Identification (RFID) technology and an Arduino to identify the pages, and read the content stored beforehand in the memory of the device. To overcome the limitations of this early version, Computed image processing was chosen, which would not require any pre-requisite storage of text data for the device to function. This resulted in the first complete prototype of the device which used a Raspberry Pi to process the image. The Raspberry Pi version took 45-75 seconds to process a single image, and had limited accuracy. This processing time was reduced to sub-14 seconds range in the current version, in which the processing sequence and algorithms were optimized and better processing hardware was used, these changes also resulted in increased accuracy.

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