Team 9 - 9/15/18

Celine Cheng, Indu Korambath, Effie Landau

NarrAUTOr

Modern life leaves little time for curling up with a book. We are constantly on the go, multitasking, and being asked to balance it all. Our hands seem to always be busy right when we need them most and the explosion of demand for audiobooks in recent years proves that people often just don't have the time or physical ability to sit through reading a book the old-fashioned way. There are many use cases for audiobooks - whether it be due to physical inability or desire to read, hold, and flip through heavy books, poor vision, or a need for mobility. The major limiting factor is that so often the books we want to read most that we already have on our shelves, don't have pdfs or audiobooks to go along with them. As such we propose to build a portable device that will be able read your favorite physical books to you in real time. Our device would be able to take a picture of the current page, process the image for text, and speak the text back to you - all the while flipping through the book as the story is read to you at your pace. We would ideally even be able to interact with the device through speech - telling it to slow down, speed up, go back, skip forward a few pages, etc in its recitation of the book.

To build this out we expect to need several components and technologies. For the basic version of our device, we would connect a camera, light source, microphone, speaker, and several servo-motors to a battery-operated Raspberry Pi loaded with Linux and proper drivers that would be attached to some sort of adjustable stand - upon which a book would be placed. With the benefit of the light source, the camera would snap a high-resolution photo of a given page sending that to the pi which would process the image using open-source and custom computer vision/Optical Character Recognition technologies to figure out the text. The pi would then process the text through some opensource text-to-speech library and would speak the words out through the speaker. Meanwhile based on where the page ends and where the device is up to in its dictation, the pi would operate the servos to flip the pages of the book accordingly. The microphone would listen for user input to direct the pi how to operate.

In a more advanced version of the device, we would be able to operate everything through one's phone. Imagine a foldable, portable stand upon which a book is placed, which has a built in page turning apparatus and which will suspend a phone above the book. The phone when connected to the device through its normal charging port could power the page turning motors, and with an app use the phone's camera, mic, speaker, and processing power to handle the image capture, processing, analysis, dictation, and operation altogether.