Software Architecture for Improving Accessibility to Medical Text-Based Information

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Abstract. The paper presents a software architecture aiming to improve accessibility to information in specialized texts, with focus on medical texts. This software also addresses other problems related to text accessibility such as vision problems and language problems. It allows text input in any media format (text, image, sound) and outputs the text as digital text or sound, permitting the user to scan the medical papers and listen to the translated and adapted text.

Keywords. medical text interpretation, machine translation

The data flow reflected in the architecture (Figure 1) consists of: data input (sound recording or image scanning), text recognition (from image or sound), text translation (when required), medical text interpreting (text post editing module) and text rendering (digital text or text to speech). The application combines techniques as: optical character recognition (OCR), speech recognition, machine translation, text analysis and text to speech (TTS). The text interpretation module (text post editing module) is the main challenge of the project, being under development. The plan for this module is to combine the fuzzy matches technique with machine translation techniques [1]. This will result in a machine translation module, which will “translate” the specialized language to the equivalent “user friendly” language. The application is under development, and a functional prototype has already been released. The current prototype does not include support for text interpretation. The prototype is built on the .NET platform, it uses a web cam as an image input device, recognizes the text using OCR Microsoft Office Document Imaging, enables text translation using Google’s machine translation web service and reads the text using TTS technology. The application has great potential in fields like empowerment of the patient, remote care and telemedicine.


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