Document Graphics Analysis: Text Extraction from Images (Bachelor Thesis)

ACCESS@KIT - Zentrum für digitale Barrierefreiheit und Assistive Technologien

We have been able to save a huge amount of effort in creating, processing, and saving accessible content for blind and Visually Impaired People (VIP) by using OCR. By converting images into a machine-readable form (digitalized format) we allow VIPs to access the content via screen readers (text-to-speech).

Unfortunately, a large number of documents nowadays come unequipped with metadata (e.g. text layer). Meaning VIPs can't access the content nor search through it. One solution is to detect the text content and crop it as an image then run OCR tools to extract the digitalized form.

There are an enormous amount of tools that can apply OCR and return the text content. Each tool has specific requirements. The input image as well should be clear and visible. Usually, the input requires preprocessing (filtering out the noise, deskewing, etc..) algorithms to obtain better results. Keep in mind that every tool has its advantages and limitations.

Hence, the main goal of this work is to evaluate available OCR tools analysing both the points of strength and weakness. The second aim is to study possible enhancement directions such as leveraging multiple tools and fusing the outputs. It is also required to experiment with prepocessing steps on the input and compare the performance before and after. And finally, the results will be integerated into a tool called AccessiblePDF to help inexperienced users create accessible documents.

This BA position will allow you to learn about the trending fields of AI, computer vision and NLP. You will also gain image processing experience using one of the top libraries in the field, OpenCV. ACCESS@KIT provides you with a high computation GPU cluster if you need to run complex OCR tools.

You are required to have basic coding skills (preferably Python) and to be ready to dive into the AI and image processing field.

Contact us if you are interested in the thesis topic. Please contact Dr Thorsten Schwarz (thorsten.schwarz@kit.edu) or Omar Moured (omar.moured@kit.edu) with a short motivation statement, your CV, and a current transcript of records. Feel free to reach out beforehand if you have any questions.