Karlsruher Institut für Technologie

Institut für Angewandte Informatik
und Formale Beschreibungsverfahren

Graduiertenkolloquium Angewandte Informatik

Document Image Dewarping and Illumination Correction using Reference Templates

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In our partially digitalized world, printed documents are ubiquitous, despite the ongoing efforts to digitalize them. Printed forms play essential roles in various business workflows, such as tracking orders and goods in commercial shipments. To process the information on these forms, data is usually inputted into a computer system through scanning or manual entry.However, both of these methods are time-consuming and inflexible, as there is not always a scanner available nearby. To mitigate this problem, recent research has focused on the development of data extraction systems that can automatically extract data from images of printed forms captured by smartphones. Due to unrestricted environmental conditions and document deformations during the capturing process, the images are often of poor quality, which makes the extraction process difficult. More specifically, the environmental factors include ambient lighting and shadows, whereas document deformations result from the capturing angle and the document's physical condition, such as bends, crumples, folds, and similar factors. In order to improve the extraction process, the images are often enhanced by geometric dewarping and illumination correction. The former aims to remove document deformations, while the latter aims to remove the effects of uneven lighting.

In contrast to prior work, we integrate reference template images in the document enhancement process. These reference templates are RGB images of the document in its digital version but without any information on the document's content, thus providing information about the expected layout. The layout information includes the document's structure, such as the position of the texts, structural lines and, logos, as well as the visual appearance of the aforementioned elements. By leveraging the prior knowledge of the document's structure and visual appearance, we improve the geometric dewarping and illumination correction processes. In particular, we propose two approaches for geometric dewarping and one approach for illumination correction, all of which integrate additional reference template information. Thereby, we bring the document images closer to their digital counterparts, which in turn improves the performance of the subsequent data extraction process.

Termin: **Mittwoch, 03. Juli, 15:45 Uhr**
Ort: Kaiserstr. 89, 76133 Karlsruhe
Kollegiengebäude am Kronenplatz (Geb. 05.20), 1. OG, Raum 1C-04
(Hinweise für Besucher: www.aifb.kit.edu/web/Kontakt)

Veranstalter: Institut AIFB, Forschungsgruppe Web Science

Zu diesem Vortrag lädt das Institut für Angewandte Informatik und Formale Beschreibungsverfahren alle Interessierten herzlich ein.

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