LMS Lehrstuhl für Multimediakommunikation
und Signalverarbeitung
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Master Thesis

for

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Text Recognition Algorithms for Screen Content Quality Assessment
Texterkennungsalgorithmen für die Qualitätsbewertung von Bildschirminhalten

Screen content (SC) refers to images and videos as they can be found on screens during office work or similar. Consequently, next to buttons, icons, and computer graphics, they contain textual information in most cases. For images containing text, human viewers place a high importance on readability of text when assessing image quality. However, conventional objective image quality assessment algorithms, such as PSNR, MS-SSIM or even screen content specific quality metrics, such as ESIM or GFM, only consider text readability indirectly, e.g. by taking into account gradient distortions, or not at all.

Since text readability plays an important role in the subjective quality assessment of screen content images, evaluating text recognition rates can be a useful addition to conventional quality metrics. However, subjective tests are not feasible, since they are too expensive and time-consuming. Instead, current Deep Learning-based text detection and recognition algorithms have shown very high text recognition rates and can be utilized to simulate the human reader.

In this thesis, Mr. Hirt will explore the application of such algorithms for the assessment of screen content image quality. First, Mr. Hirt will research state-of-the-art text recognition and detection methods. Since ground truth textual information is not included in available screen content datasets, Mr. Hirt will generate a labeled dataset to evaluate the efficiency of the researched algorithms on screen content data. Available datasets with subjective quality scores will be utilized to investigate the correlation between text recognition rates and human judgement. Since most datasets do not contain textual ground truth information, in a further step, Mr Hirt will investigate the feasibility of using recognized text from pristine images as ground truth instead. A structured implementation and detailed documentation of the framework and the performed experiments is part of the work.

Start: 01.02.2023
End: 31.07.2023

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