

Supervisor report

for the master thesis

„Enhancing TableNet’s Validation: Evaluating the Accuracy of the Existing Architecture with Novel Training Data“

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Summary

Mr. Krishna Sahukara discusses in his thesis an approach to improve the training and evaluation of AI-based methods for extraction of tabular data. Understanding tabular data in documents is an important part of automated document processing. However, good labeled data sets to train supervised AI-based methods are hard to come by. Mr. Sahukara presents an approach that will generate an arbitrary amount of ground truth data for table recognition. The approach is used to evaluate the performance of TableNET, a well-known framework for table recognition, on previously unseen data.

Evaluation of the content

Mr. Sahukara uses a scripted LaTeX framework to produce arbitrary documents containing arbitrary tables. Tables are varied both in style and content, surrounded by text, and placed in various positions on a page. Mr. Sahukara discusses how, from the PDF document generated by LaTeX, the exact table position can be recovered. This is not trivial without reimplementing the TeX layout algorithms.

Having both, the generated page and the ground truth for the table position on the page, Mr. Sahukara proceeds to evaluate the performance of TableNET on the newly generated data. The evaluation is based on two measures: Intersection over Union, which is commonly used in object detection, and a newly proposed bitwise XOR measure, which indicates prediction error pixel by pixel.

Mr. Sahukara discusses how to post-process TableNET prediction in order to improve prediction accuracy. He demonstrates then that, even on unseen data, TableNET can achieve quite low error rates for table prediction. The TableNET architecture is evaluated with two different resolutions: 256×256 and 1024×1024 . Mr. Sahukara shows that, irrespective of the data set, the higher resolution produces better results, despite the additional visual noise introduced by the increased resolution.

Structure and quality of presentation

The structure of the thesis is clear, following common scientific standards, and the text is quite readable without major language problems. Mr. Krishna Sahukara illustrates his approach quite well with expressive figures, tables and diagrams. The evaluation is good and meaningful, although, given more time, a more extensive evaluation could provide more precise and reliable results.

Collaboration with the student

Mr. Sahukara was at all times diligent and responsive. He produced a good end result, although in some instances extra time was needed by him to grasp certain concepts. Encouraging growth in immediate comprehension and fostering more proactive initiative could further elevate his performance. Nonetheless, his results remain valuable and relevant.

Result

Overall, I rate the thesis as: **1.7 (gut, good)**

Deggendorf, 24. August 2023

Prof. Dr. Andreas Fischer