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Dear Editor,

I am pleased to submit our manuscript titled Generation and Detection of Objects in Documents by Deep Learning Neural Network Models (DeepDocGen) for consideration in the International Journal on Document Analysis and Recognition (IJDAR). This study presents a robust and modular pipeline designed to address the challenges of training object detection models in the context of PDF documents, with a specific focus on Petrobras documents.

Our research introduces a synthetic document generation approach to overcome the limitations of publicly available datasets and the time-consuming process of manual annotation. By leveraging this pipeline, we generated realistic layouts and automated annotations, significantly improving the quality of training datasets for object detection models. In our experiments, the RT-DETR model achieved a mean Average Precision (mAP) of 96.30%, outperforming other state-of-the-art models like Mask R-CNN and Mask DINO.

This work highlights the flexibility of our pipeline, which is not only applicable to industrial contexts, such as Petrobras, but also adaptable to other domains, including education and healthcare. For example, the pipeline could generate tailored layouts for teaching materials or synthetic medical records to train information extraction models.

We believe this manuscript aligns with the scope of IJDAR due to its focus on the intersection of computer vision, document processing, and synthetic data generation. Our work contributes to advancing document layout analysis and offers a scalable solution for training object detection models in real-world scenarios.

This manuscript is original, has not been published elsewhere, and is not under consideration by another journal. All authors have approved the submission and have no conflicts of interest to disclose.

Thank you for considering our submission. We look forward to your feedback and are happy to provide any additional information if needed.

Sincerely,

Loïck Geoffrey Hodonou

Master’s Student

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