

DREAM: Document Reconstruction via End-to-end Autoregressive Model

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Abstract

Document reconstruction constitutes a significant facet of document analysis and recognition, a field that has been progressively accruing interest within the scholarly community. A multitude of these researchers employ an array of document understanding models to generate predictions on distinct subtasks, subsequently integrating their results into a holistic document reconstruction format via heuristic principles. Nevertheless, these multi-stage methodologies are hindered by the phenomenon of error propagation, resulting in suboptimal performance. Furthermore, contemporary studies utilize generative models to extract the logical sequence of plain text, tables and mathematical expressions in an end-to-end process. However, this approach is deficient in preserving the information related to element layouts, which are vital for document reconstruction. To surmount these aforementioned limitations, we in this paper present an innovative autoregressive model specifically designed for document reconstruction, referred to as Document Reconstruction via End-to-end Autoregressive Model (DREAM). DREAM transmutes the text image into a sequence of document reconstruction in a comprehensive, end-to-end process, encapsulating a broader spectrum of document element information. In addition, we establish a standardized definition of the document reconstruction task, and introduce a novel Document Similarity Metric (DSM) and DocRecTK dataset for assessing the performance of the task. Empirical results substantiate that our methodology attains unparalleled performance in the realm of document reconstruction. Furthermore, the results on a variety of subtasks, encompassing document layout analysis, text recognition, table structure recognition, formula recognition and reading order detection, indicate that our model is competitive and compatible with various tasks.

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1. Introduction



Figure 1. Illustration of motivation of the proposed DREAM. (a) The multi-stage based approach, utilizes a variety of document understanding models to predict distinct document elements, subsequently amalgamating them into a comprehensive document reconstruction format via heuristic rules. However, this method is constrained by the propagation of performance errors. (b) The end-to-end based approach, which employs generative models to acquire the sequence of plain text, tables and mathematical expressions, yet falls short in preserving the physical information pertaining to layouts and performs not satisfactorily enough on the logical reconstruction result. (c) Our proposed DREAM, which exhibits the capability to restore an extensive range of document contents in a more holistic manner, encompasses physical and logical reconstruction information.

Document reconstruction is an integral research of document understanding, which harbors significant potential to provide richer structured information for Large Language

Dream Document

JA Banks



Dream Document:

Reviewing **Dream Document**: Unlocking the Spellbinding Force of Linguistics

In a fast-paced world fueled by information and interconnectivity, the spellbinding force of linguistics has acquired newfound prominence. Its capacity to evoke emotions, stimulate contemplation, and stimulate metamorphosis is really astonishing. Within the pages of "**Dream Document**," an enthralling opus penned by a highly acclaimed wordsmith, readers attempt an immersive expedition to unravel the intricate significance of language and its indelible imprint on our lives. Throughout this assessment, we shall delve in to the book is central motifs, appraise its distinctive narrative style, and gauge its overarching influence on the minds of its readers.

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