ARIA
APPLIED RESEARCH IN ACTION

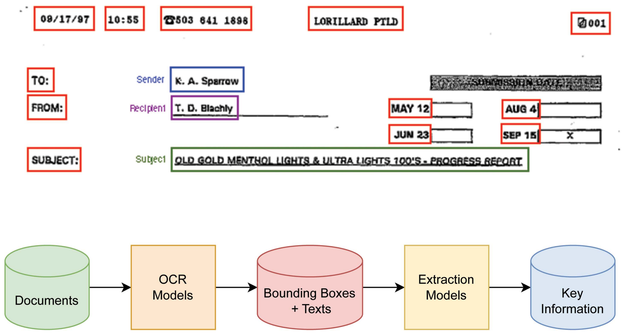
Two-Stage Deep-Learning Framework for Understanding Scanned Documents

Using a deep OCR model to identify texts and a transformer language model to extract relevant texts

Tsz Fung (Aiden) Yau

Gerald Penn
ACADEMIC SUPERVISOR

Simrandeep Singh
INDUSTRY SUPERVISOR



PROJECT SUMMARY

Scotiabank gets a lot of documents for various kinds of applications like mortgage approval and credit card approval. It takes a lot of manual work and time to validate them by customer agents. To speed it up, we built an automated document-understanding pipeline to extract relevant information from documents across various domains, like electronic and scanned forms, with minimal manual effort. Current rule-based approaches, however, cannot properly handle noises or rotations in scanned documents. To address this issue, we propose a machine-learning framework that can capture complex patterns of noisy and rotated text.

Our two-stage framework employs a custom-made deep OCR model using open-source EasyOCR and PaddleOCR libraries to identify texts from documents, plus another entity extraction model LayoutLMv2 to tag the target information from extracted texts. We observe that it achieved a 90% recall in OCR tasks on noisy banking documents as compared to 15% in the baseline Tesseract model. The result demonstrates that the machine-learning approach can handle scanned documents well by reducing the OCR errors which propagate in extraction models. We continue to explore other approaches such as OCR-less models for further improvement on scanned items.

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Computer Science
UNIVERSITY OF TORONTO
Master of Science in Applied Computing