CitiusTech

Shaping Healthcare Possibilities

Success Story

NLP and OCR for HCC scoring and identifying high-risk patients
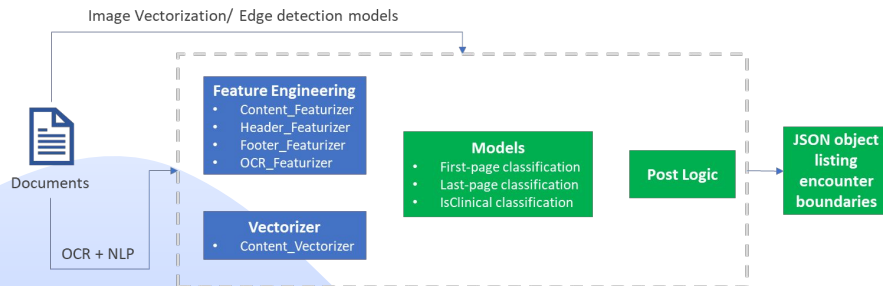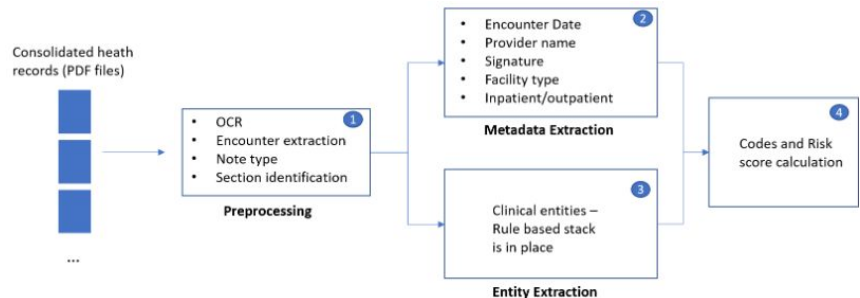
The Challenge

- The Client is a global leader in information, software solutions and services for professionals in healthcare
- Client wanted to extract clinical diagnoses and other information from unstructured clinical records for HCC scoring and to identify high risk patients
- OCR for electronic as well as hand written text, patient metadata extraction
- On demand NLP for clinical data abstraction
- HCC data mapping to calculate HCC score
- Identify high risk patients using HCC score
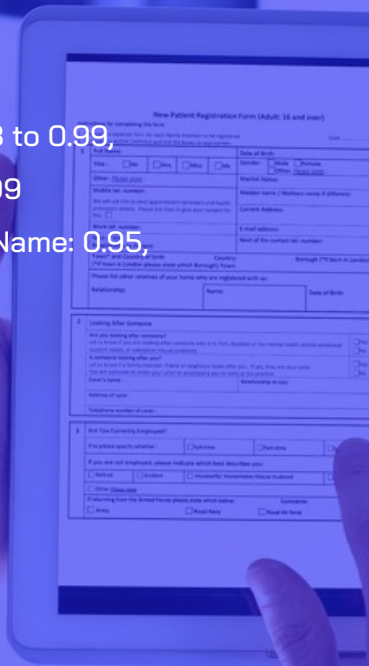
Solution Highlights

The Solution

CitiusTech developed NLP based pipeline to extract attributes from clinical notes and use of APIs provided by CMS to pre-populate risk scores

Solution input: Consolidated health records in PDF format

- Hand written object detection using transfer learning with pre-trained YOLO v3 model
- Classification models to classify each section header in a clinical note.
- Classification models to classify each page of input pdf documents into well-defined labels (Non-clinical, Encounter-start - intermediate - end)
- To extract provider name, credentials, electronic and handwritten signatures, encounter dates and calculate confidence score
- Disease interaction service helps associations between diseases to identify high severity.

The Outcome

- Handwritten signature extraction: Precision: 0.71, Accuracy: 0.86
- Section Classification: Accuracy: 0.93 to 0.99, F1 score: 0.42 to 0.93, AUC: 0.91 to 0.99
- Entity Extraction Accuracy: Provider Name: 0.95, E-Signature: 0.89
- 60% time reduced for claim reviews
- Improved claim reimbursement

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Thank You

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