

REAL-TIME TEXT ANALYTICS FOR IMPROVED MEDICAL DECISION SUPPORT

Highlights

Industries

- Healthcare, Insurance, Auditing

Outcomes

- Logical representations of best practice decision trees
- Annotated data sets that yield training sets and truth keys
- Productionized, algorithmic software that determines and applies the correct condition model
- Real-time follow-up care recommendations output to custom user interface
- Log files to assess and retrain model performance
- Modular, object-oriented structure, scalable for additional conditions

Statistics

- Three conditions with future expansion to >25 conditions
- 35,000 dictations
- Sub-second run margins

Technical Areas

- Data Science
- Data Ingestion and Modeling
- Real-Time Analysis
- Integrated Solutions
- Text Analytics
- Machine Learning

Technologies

- Python
- Restful APIs
- C#
- Annotation Software (brat)
- NLP

Data

- Dictation files
- Best practice cards
- Medical subject matter expertise
- Patient exam details

Using data science to extract critical information for recommendations in a real-time care support tool

Business Challenge

A radiology firm required a means to more quickly and accurately provide best practice recommendations based on dictated reports describing medical images

A large nation-wide radiology firm analyzes hundreds of images each day. Each analysis is explained in a dictation that describes what is seen by the radiologist. If certain issues are detected/described, the radiologist refers to the accepted best practices to make the proper recommendation for follow-up care. Consulting these decision trees takes considerable time. The client asked ILW to extract the relevant information from each dictation and provide the radiologist with the appropriate best-practice follow-up care recommendation for specific conditions to increase compliance and improve the consistency of patient care provided.

Innovative Solution

ILW created a rapid algorithm to analyze dictated report text in real time to provide radiologists with follow-up recommendations for identified conditions

ILW analyzed the speech patterns of radiologists to train a custom-built algorithm to identify specific conditions routinely described by radiologists. These conditions are described by specific types of measurements and

medical terminology, which when combined, indicate a particular course of follow-up care. Once text is analyzed, ILW's algorithm extracts the requisite measurements and descriptions unique to each condition. These factors are then fed to automated decision trees that produce the appropriate recommendation. This entire process takes tens of milliseconds, effectively producing an instantaneous response for the radiologist as they are dictating. This response is presented to the radiologist, and if approved, inserted into the report.



www.illuminationworksllc.com