MOSS
A Natural Language Based Clinical Monitoring Assistant

PHUSE US Connect 2019

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ABOUT US

A life science services company that develops innovative services and solutions to augment research across multiple clinical study phases and therapeutic areas.
Problem Space

- TIBCO Spotfire, Tableau and QlikView are common tools used by clinical data visualization teams.

- Clinicians rely on visualization and data teams to get answers to their questions which is often time consuming and frustrating.

- Resource Hog in terms of people, license and computing.

Inspite of all these efforts,

Are you getting the right answers about your clinical data?
Solution

Connect your EDC or CDISC datasets to MOSS

Just Ask your question and you will get your answer
Different Approaches

WikiSQL

- **COMPETITION DATASET**
  80654 natural language questions and SQL from 24241 wiki tables

- Input table schema, question and predict the SQL

- Continuous improvement by reinforcement learning

- Does not take care table joins
Different Approaches

Multiclass Classification

Define the classes from the dataset
Train a model to learn the class properties
Map a new question to any one of the predefined classes
Neural Machine Translation

- MACHINE TRANSLATION
  The task of automatically converting source text in one language to text in another language

- NEURAL MACHINE TRANSLATION
  An approach that uses a large artificial neural network for converting source language to another

- THE STRENGTH OF NMT
  Ability to learn directly, in an end-to-end fashion, the mapping from input text to associated output text

Example:
OpenNMT (Open Source Neural Machine Translation System)
Different Approaches

NLU Models

- **NATURAL LANGUAGE UNDERSTANDING (NLU)**
  Branch of artificial intelligence (AI)

- Uses computer software to understand input sentences and make sense of it

- NLU models uses algorithms to reduce human speech into a structured ontology

- It can pull out things such as intent, timing, locations and sentiments

Example:
**RASA NLU model mainly used for chatbots**
Platform Capabilities

- An AI Powered NLP based Clinical Data Visualization tool
- Continuous Learning Engine which will capture the user query patterns and update the models accordingly
- Support multiple Charts, Graphs and Statistical Analysis
- Clinicians can create dashboards for different sites, trials, patients etc.
- Maintains question history so that questions can be recommended
- Voice Interface for ease of use
- Scalable SAAS /On-Premise installations
- CFR Part 11 Compliant
MOSS Applications

- Data Validation
- Safety Analysis
- Pharmacovigilance
- Signal Detection
- Clinical Analysis
- Remote Monitoring
Potential Users

- Clinical Data Monitors
- Clinical Data Management
- Biometrics
- Regulatory Affairs
- Remote Monitoring Teams
Case Study

- Piloted at a CRO on 5 ongoing oncology studies
- MOSS powered the Clinical Data Visualization to the sponsor
- Convenience to monitor was the highlight
- Cost Savings on yearly licenses
- Ease to connect to the datasets and visualize
- Voice interface for easy access
- Patient Narratives
Pharma Adoption

- Need a team to adopt the platform
- Decision on On-premise Vs SAAS
- Select a TA and a Study to pilot
- Develop question banks for the TA
- Establish a deep learning pipeline
Dashboards

Default Dashboard

show frequency of mild moderate and severe advers...

list sites with number of treatment emergent adverse...

Saved Dashboards

Default Dashboard
display patient narrative for subject mos-040-0001-170

Study            MOS-TST
Patient          MOS-040-0001-170
Age              64
Sex              MALE
First Dose Date  2014-10-21T11:30
Last Dose Date   2011-2014

Patient MOS-040-0001-170 is a 64-year-old MALE who was first diagnosed with multiple myeloma on 7/10/2014.

Prior to enrolling in the study, notable medical history is provided in Table 1. The patient initiated dosing with Study Medication on 2014-10-21T11:30. Adverse events, Concomitant medications, and supportive care are provided in Tables 2 and 3.
Contacts

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