

Santhosh Kolloju

Experience:~5years

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EDUCATION

VELLORE INSTITUTE OF TECHNOLOGY (Upscale Program by Wipro)

- Masters, Data Science

GPA: 8.13

Chennai, India

Dec 2014-May-2017

MVSR ENGINEERING COLLEGE (OSMANIA UNIVERSITY)

- B.E Computer Science

PER: 84%

Hyderabad, India

July 2010-May-2014

EXPERIENCE SUMMARY

I have completed My Bachelor's degree in computer science from MVSR Engineering college (Osmania University) and Masters in Data Science from VIT University. Currently Working in GAA Vitality team an applied research group in fidelity investments. My work is focussed towards **Natural language processing** using various machine learning and **deep learning** techniques, Prior to this I was working in Manufacturing Analytics team in **WIPRO** Technologies where my focus area was on analysing and creating machine learning and statistical based models for semiconductor manufacturing industry.

SKILLS

Programming : Python, Pytorch , Tensorflow, SQL, JQuery, Javascript, HTML, CSS

Machine learning: Logistic Regression, Decision Trees, Random Forest, Boosting Algorithms, Bagging Algorithms, Clustering, K means, Hierarchical clustering, Dimensionality Reduction, PCA , LDA, SVD, Tf-IDF

Deep Learning: Gradient descent, FNN(Feed forward neural network), RNN, CNN, LSTM, Transformer Models, Attention Mechanisms, Optimization, Word2vec, Elmo, Glove, FastText, BERT, Universal sentence encoder, Transfer learning

Web Frameworks: Flask, Django

WORK EXPERIENCE

SOFTWARE ENGINEER (AI Applied Research)

FIDELITY INVESTMENTS, BANGALORE **DEC 2018 - PRESENT**

ASSOCIATE DATA SCIENTIST

WIPRO TECHNOLOGIES BANGALORE **JUNE 2014 - OCT 2018**

PROJECTS

Defined Benefits Letter Generation: Fidelity manages Defined Benefits (DB) account for its customers, who call the reps to answer queries related to their Benefits plans. These calls may be pushed as tickets. the tickets once resolved , may result in hand written letters which are sent to the respective customers . I am working on creating a deep learning model which can automatically write letters from the research notes . This comes under Natural language generation problem (NLG).

Methods Implemented :

- 1) Abstractive summarization using pointer generator networks with coverage mechanism to generate meaningful letters and reduce the manual effort.
- 2) Transfer learning approach with BERT(Bi Directional Representations From Transformer Networks) as Encoder and Transformer decoder which is trained from scratch.

Health & Welfare Smart Compose: Smart compose is an assistant which helps the associates to write the letters to the clients or participants much faster. This is similar to the smart compose option implemented in GMAIL.

Methods Implemented:

- 1) RNN Based approach trained a sequence to sequence model with previous mail content as well as the research notes as the context.
- 2) Transformer based model with encoder and decoder architecture. Where the context is sent to the encoder and the decoder is trained to predict the next best sentence.

This model has been modified to fill the missing / unknown words predicted by the pointer generator model.

I-Knowledge(Smart Question Answering Tool): Fidelity operations floor deals with a lot of queries from customers and answering to them requires access to a lot of information. This information is contained in thousands of documents. Presently, the queries are resolved by going through the documents manually. I have developed a Question Answering tool to solve this problem.

Methods Implemented:

- 1) BiDAF (Bi directional Attention Flow) model using Elmo Embeddings
- 2) BERT model fine tuned for machine comprehension

Trending As A service: Business units receive tickets to solve from either participants or clients. Most of the time higher management is not aware of the major volume drivers of the problems. Manually coming up with different trends in the data is a huge effort and not always the correct way as there can be a human bias. We have built a tool for unsupervised coming up trends in the data. The solution was built in a very efficient and scalable manner so that it can be readily deployed to different business units with minimal effort.

Methods Implemented:

- 1) tf-idf weighted Word2vec and fast text algorithms for getting the word embeddings
- 2) Connected components & Hierarchical clustering algorithms for coming up with trends
- 3) Allen NLP Architecture concepts for scalability

Recommendation Engine: IT & infrastructure management team which works on support receives the problems which are mostly repetitive in nature (like disk failure on a server). Analysts who are solving this spend 80% of their time analyzing the problem and remaining solving the actual problem. To increase efficiency, we have built a recommendation engine which given a new problem recommends the most probable solutions which have worked in the past.

Methods Implemented:

- 1) tf-idf weighted Word2vec and Universal sentence encoder for getting the embeddings
- 2) cosine similarity measure for finding the similar resolutions
- 3) Ranking the resolutions based on recency, frequency and feedback from user

Root Cause Analysis: Developed an end-to-end automated root cause analysis solution for leading flash drive manufacturer enabling them to pinpoint the equipment or material lot, which caused the yield excursion at the end of manufacturing.

Data Mining Automation: Developed an automated Data mining tool, which can be used for initial data exploration or data understanding in any analytics project. This helps the non-technical people and domain experts in a team to play around with the data, build models with selected variables and see the performance of the model without them writing any code.

ETL Automation(OSRAM): Developed an automated tool for building dynamic SQLs on the fly according to the defined metadata and creates a workflow to build the final data mart for analysis and model building.

Personal Projects

Transfer learning Approach for Abstractive summarization:I have used a library called texar to implement the abstractive summarization using Transformer Encoder with pre trained bert weights and Transformer decoder is trained from scratch.(<https://github.com/santhoshkolloju/Abstractive-Summarization-With-Transfer-Learning>)

Structured Self - Attentive Sentence Embedding: Implemented the paper Structured self attention_which was published in ICLR 2017.Implemented Classification using **Quora Question pair dataset**.

Facial Similarity matching:I have used pretrained facenet model and have built a pipeline to compare the similarity of faces in given images.(<https://github.com/santhoshkolloju/FaceSimilarity>)

Intelligent Cropping of Images:people upload larger resolution photos which cannot fit into the banner size on the websites,once the photo is uploaded to the site they have to crop the image to fit the size.normal cropping algorithms doesn't know where the object is present in the image which results in wrong cropping, i have used object detection deep learning model to detect the object in the images and intelligently crop the photo to the required size(<https://github.com/santhoshkolloju/Intelligent-Cropping-of-Images>)

Achievements:

1. One of the top 20 teams out of 2000 teams in **MICROSOFT AI CHALLENGE 2018** ,The problem statement was to improve the bing search results using machine learning or deep learning.(<https://github.com/santhoshkolloju/MAI2018>)
2. Second Runner up (India level) Wita-thon a hackathon conducted by Fidelity where we presented the idea of Trending in Operation floor.
3. Multiple on the spot awards for outstanding contribution towards the work.