Faik Aydin

Data Scientist & Mechanical Engineer

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EXPERIENCE

Telstra, Melbourne —Data Scientist

Jan 2019 - PRESENT

Self-Started Graph Learning & Social Network Analysis Project for customer retention and cross-sell

Data Science lead for international inbound fraud towards Australia. In charge of modeling and blocking international traffic towards Telstra against malicious scammers.

Machine Learning Engineer in NLP project Agent Assist. Working on continuous improvement and context extraction

Machine Learning Engineer in Computer Vision object detection project. Edge computing & Optimization for large vision models to run on edge cpu devices over 5G streams.

Bluerock, Melbourne — Data Scientist

Feb 2018 - Jan 2019

Geospatial Modelling for placemaking

Supply and Demand Forecasting of services in a geospatial location using multiple data sources.

Roketsan, Ankara — *R&D Control Engineer*

Jan 2015 - Sept 2016

ROKETSAN is in the defense systems industry.

Served as a Control System (Mech/Elect) Engineer on SMART WINGS (long-range missile wings that adapt to the surroundings and change shape in order to save fuel and better accuracy).

EDUCATION

Monash University, Melbourne— *Master of Data Science (Research)*

Feb 2017 - Dec 2018

Studied Under the International Merit Scholarship • **Research Thesis**: Medical Multimodal Classification and Detection Under Small Data Conditions • Graduated, WAM: 81.313/GPA: 3.625, **H1 High Honours**

SKILLS

Proficient in : Python, R, TensorFlow, PyTorch, Natural Language Processing, Deep Neural Network Architecture Design, Microcontroller Programming, Control Systems, C + +, SQL, High Distinguished in Data Structures and Algorithms, MATLAB, Linux Shell, Tableau, Hadoop, Scala, Spark, JavaScript, reactjs

AWARDS

Global Talent Award in Data Science (May 2020) - Awarded by Australian Home Affairs, Global Talent team for excellence in the field of data science.

KAIST Bio-Brain Engineering Scholarship Grant (April 2019) - Awarded by Korea Advanced Institute of Science and Technology (who is world-leading in the field of medical imaging) for excellence in Post-Grad research and performance

International Merit Scholarship (2017) - Post Graduate scholarship awarded by Monash for excellence in academia.

TUBITAK Research Grant (2016)

Bilkent University, Ankara— *Bachelor of Mechanical Engineering*

Sept 2011 - Dec 2016

Mechatronics Electives and Minor in Philosophy

SELECT PROJECTS

Medical Multimodal Classification and Detection Under Small Data Conditions (2017)

A multimodal (text & image) classification problem with the collaboration of the Alfred Hospital (VIC - AU). The aim of the project is to utilize doctor notes along with images to identify chest x-ray abnormalities. The project focused on CNNs for both image and text. The reasoning behind CNN use in texts is the nature of the doctor notes, not having long sequential nature, short independent sentences from one another (no requirement for long term memory). The image submodel is benchmarked large networks (like imagenet and resnet).

We look into using transfer learning from larger sets (opensource) and applying them to smaller pools of data in our local hospitals.

The main pain point in the industry in general (especially in the health sector) is the explainability factor of decisions made by black-box models. The paper extends to use the integrated gradients technique to localize on both CNN submodels to understand as a collective why an image and text input was classified the way it was.

All experiments were done with Tensorflow (Py 3), and processing was done on GPUs.

Related links

https://arxiv.org/abs/1902.08888

Public works were moved to Keras and Notebooks (https://github.com/faikaydin/medical-multimodal-with-transfer-learning): Does not include local hospital datasets for privacy reasons. Does not include experimentation code.

Agent Assist (2018)

This is a Telstra NLP Project. Telstra is Australia's largest telco. The project aims to improve the quality of life for front-of-house workers who are dealing with customer complaints. The aim is not to automate the process but assist in auto-completing and suggesting canned responses to the agent who is chatting with the customer. The KPI of the project is to record the improvement of agent performance with and without the Agent Assis plug-in.

I joined the project halfway into its lifecycle. I was tasked to be in the continuous improvement team. What I brought to the project was the

Related links

https://github.com/faikaydin/article-classification-with-transfer-learning

*Not project repo, but a small project & exercise I did while I was researching the relevant topics

concept of using transformers (the production model was using skip-thought sentence embeddings). I had a strong belief that utilizing everyday question forum datasets (like the quora dataset) will be helpful. The questions constructed by the customers shared a lot of similarities with the opensource data (syntax-wise, style-wise, etc.). The main idea was to use transformers, pre-train the model on open-source question forum datasets. Then fine-tune the embedding parameters with the large Telstra customer questions. The embedding performance showed a high degree of improvement compared to what was in production and soon replaced it. The entire project ran on Tensorflow and Scala.

Object Detection on edge over 5G (2019)

A project I developed for Telstra's Vantage event (one of Melbourne's largest Tech events hosted by Telstra) with Telstra labs.

This was a solo project and it was funded by Telstra's R&D department (Telstra Labs). The goal was to detect suspicious objects and behavior using body cameras.

This was done in two ways:

The image sent in real-time from the convention to Telstra main offices over 5G through a secure protocol, processed on GPUs using YOLO.

The image is processed on an optimized YOLO in the Bodycam (buffed with a CPU chip) using a customized OpenVino framework.

Everything was written in Tensorflow & Python. For CPU processing used OpenVino.

Related links

On a related note, please find an article I worked on that was published by Telstra about Vantage

https://exchange.telstra.com.au/author/ezra-aydin/

NUMBAT (2020 - Ongoing)

The NUMBAT team collectively is in charge of blocking calls. I am in charge of international call blocking and detecting Wangari & IRSF scams using inbound call data. Used technologies like Spark, Kafka, Pyspark, and Cassandra. The current state of blocking is I am blocking 1.5 - 2 million inbound calls to Australia with my anomaly detection model. This is saving a significant amount of money not only for Telstra but Australia as a whole also improving customer experience at the same time.

The NUMBAT team was awarded the Team of the year award within Telstra for an estimated 300M AUD saved for Telstra & Australians over the year.

Telstra Social Network (2020 - Ongoing)

A personal project that is currently being funded by Telstra. Using the CDR records of customers to derive social features of Telstra customers to improve CX and customer retention. Using Spark and Kafka technologies to treat the CDR data to a graph-ready format. Using Python to construct graphs. Using Sci-kit and NetworkX to extract graph theory features from nodes (customers) and using those in linear models. Using Tensorflow to convolute over the graph (non-linear, retaining a sense of position in a finite space) for more complex models for churn and CX measures.

Currently hosting these features for other teams to use.