Mukund Kalantri

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EDUCATION

The University of Colorado, Boulder - MS Computer Science — **August 2021 - May 2023**
Coursework: Machine Learning, Data Mining, NLP, Algorithm Design, OOAD, Deep Learning, Datacenter Scale Computing — GPA: 3.92/4.0

Symbiosis University of Applied Sciences, Indore, India - B. TECH Computer Science & Information Technology — **August 2016 - May 2020**
Coursework: Machine Learning, Artificial Intelligence, Data Structures, Data Mining, Algorithms, Software Engineering — GPA: 8.89/10

TECHNICAL SKILLS

Languages: Python, R, Java **Database:** MySQL, MongoDB, PostgreSQL **Web Technology:** HTML, CSS, JavaScript, Flask
Miscellaneous: Oracle WebLogic Server, Git, Google Cloud Platform, Tableau, RabbitMQ, Redis, Docker, Kubernetes, Rasa, Google DialogFlow, JIRA
ML Libraries: TensorFlow, Keras, PyTorch, MLFlow, NumPy, Pandas, Scikit-Learn, Matplotlib

WORK EXPERIENCE

Technical Analyst 2, *Oracle* — **July 2023 – present**
- Resolved over 250 Service Requests across various severity levels, maintaining a high customer satisfaction rating of 4.8 out of 5.
- Achieved a 90% resolution rate for technical issues within SLA timeframes, employing advanced troubleshooting techniques such as thread and heap dump analysis, system configuration analysis, and server debug logs.
- Demonstrated expertise in WebLogic Server, optimizing its performance and ensuring system stability.
- Utilized strong problem-solving skills to diagnose and resolve technical issues, while effectively collaborating with cross-functional teams to prioritize tasks and achieve collective goals.

Graduate Research Assistant, *Earth Lab, CU Boulder* — **May 2022 – Aug 2022**
- Investigated multiple alternative aspects of forest diversity using an NSF-funded NEON dataset as a part of the forest biodiversity project.
- Conducted data analytics to extract structural and spectral diversity metrics from the Lidar point cloud and Imaging Hyperspectral data.
- Contributed to R library developed by the Earth Lab, for working with NEON diversity data.
- Presented interesting findings with the help of several visualizations, along with the preprocessed data to senior researchers on this project.

Software Developer, *Mindpath Tech* — **July 2020 – June 2021**
- Developed chatbots using frameworks like Rasa, Google DialogFlow, and Many Chat, along with Python to summarize client organization's work.
- Led a couple of chatbot projects and participated in client meetings. Involved in the entire process from chatbot creation to testing and handover of the project to the clients.
- Deployed more than 12 chatbots on client websites and social media platforms, including Facebook, Telegram, WhatsApp, and Slack, to provide easy access on multiple platforms to the customers, of our client organizations.
- Increased customer engagement by 30% through chatbot implementation, leading to a 15% increase in overall customer count for our clients.

Robotic Process Automation Intern, *Predikly Technologies* — **July 2019 – Jan 2020**
- Developed scalable Robotic Process Automation bots for clients which increased the work efficiency of their organization and reduced the workforce needed for redundant tasks.
- Mentored new joiners by providing them training on Automation Anywhere and Python.

PROJECTS

Threat Modeling and Vulnerability Assessment using Machine Learning (Velentium LLC – sponsoring company)
- Revamped Velentium's inefficient and time-consuming Threat Modeling process using ML, improving accessibility, and reducing human hours, resulting in increased productivity.
- Conducted experiments with various data collection and storage methods and ML models to improve performance and scalability, resulting in enhanced efficiency and effectiveness of the overall system.
- Developed an automated ML pipeline that quickly and accurately preprocesses inputs from the Microsoft Threat Modeling Tool and generates threat scores, significantly reducing the time required for the process.
- Advised Velentium on the implementation of the new and efficient ML-based threat modeling method in their upcoming tool, resulting in increased accessibility, improved productivity, and enhanced safety of medical devices.

The Drug Dealer - An Electronic Assistant for Prescription Drugs
- Addressed the problem in the process of collecting prescription drugs, where patients were required to visit multiple pharmacies to obtain all the necessary medications.
- Developed a microservice application that utilizes an optimized algorithm to suggest the minimum number of pharmacies a patient needs to visit after taking a medical prescription image as input.
- Built the application using a Kubernetes cluster environment with MySQL as a database, Min.io for temporary image storage, Redis for message queuing, Google Cloud Vision API for text recognition, and SendGrid email API for user communication.
- Successfully tested and implemented the application, resulting in a highly efficient, scalable, and cost-effective solution that saves time and effort for patients and medical professionals while addressing the problem of collecting prescription drugs.

Music Separation-as-a-Service
- Devised a music separation service capable of extracting separate components for different instruments and vocals from a music file.
- Created a microservice music separation application capable of utilizing Facebook's Demucs open-source Waveform Source Separation library to split a .mp3 file into separate bass, drums, and vocals .mp3 files.
- Built the application using a Kubernetes cluster, utilizing Min.io as a local storage bucket, and Redis as a message-queuing system, to ensure the application's scalability and reliability. The Facebook Demucs Docker image was used as the core of the service.

- Developed and tested the music separation service successfully, providing an efficient solution for separating individual tracks from a .mp3 file, improving the music production process's efficiency.

Automated Indian Number Plate Recognition

- Identified the need for a real-time number plate detection system to address the challenges posed by the various fonts and designs used in Indian license plates, making existing number plate detection systems less effective in India.
- Constructed the system using bounding box regression to detect number plates in live traffic images. Utilized convolutional neural network (CNN) models and other advanced image processing techniques to extract text from the number plates.
- Implemented the system using Python and OpenCV and trained the model on dataset comprised of multiple annotated datasets, each representing a different category of license plate design. Tested the final product on videos of various traffic scenarios.
- Achieved good speed and decent accuracy with the developed system, offering the foundation for a more sophisticated system that could be used in potential applications like speed ticketing, automated parking, and other related fields.

Attendance Management using Face Detection and Recognition

- Devised a project that leverages live camera feed to automate attendance maintenance for students by recognizing their faces, streamlining the process, and increasing efficiency.
- Implemented a Haar Cascade classifier to detect faces in live images and LBPH Face Recognizer to recognize those faces. Recorded the identified faces in a MySQL database for attendance tracking purposes.
- Developed the system using Python, OpenCV, and MySQL, where the model was trained on a dataset created by taking pictures of each student to ensure precise face recognition. Tested the final product on various live camera feed scenarios, achieving remarkable accuracy and reliability.
- Efficiently fulfilled the need for automated attendance tracking in educational institutions using the developed system, with potential applications in other industries as well.

Image Caption Generator

- Created a project aimed at generating image captions for use in various applications for individuals who are blind or visually impaired.
- Experimented with combinations of different ML models to convert images into text representations, using Python, OpenCV, and ML libraries.
- Utilized pre-trained Convolutional Neural Networks (CNN) to generate image embeddings, which were then used by Long Short-Term Memory (LSTM) models to synthesize text. The models were fine-tuned on a large dataset consisting of multiple captions for each picture.
- Proved the efficacy of the system in generating image captions and its potential utility in various applications such as image recognition and navigation systems to assist the visually impaired.

Airline Analytics

- Performed an analysis on a large dataset of over 2 million recent flight records in the US to reveal hidden patterns and insights.
- Found interesting hidden patterns in airline and airport operations by implementing classical data mining techniques.
- Explored various types of ML models to determine the most reliable ones for predicting flight cancellations and delays, as well as to identify reasons for cancellations.
- Presented findings using informative and visually appealing charts and tables, which could be utilized by airlines and airports to optimize flight operations, improve customer service, and increase business opportunities.

Boulder Apartment Finder Website

- Collaborated in a team to develop a web application that enables users to search for apartments in Boulder City, book apartment tours, and perform sentiment analysis on their feedback to rate the apartments, thereby providing valuable feedback to apartment owners and improving the overall apartment-searching experience.
- Contributed to the front-end development of the project and used Stanford's CoreNLP library for sentiment analysis.
- Used HTML, CSS, and JavaScript to develop the front end, while also utilizing MySQL as the database. Assisted in implementing backend functionality using Java, ensuring seamless communication between the front end and the back end.
- Demonstrated the application successfully, by showcasing how users can easily find apartments in Boulder City, book apartment tours, and rate their experiences using the web application.

Patronizing and Condescending Language Detection

- Addressed the need to identify patronizing or condescending language in texts towards vulnerable communities, such as refugees, homeless people, and poor families, and developed several natural language processing (NLP) models to solve the problem.
- Implemented various language models, including Bi-Directional LSTM and BERT, and trained them on the SemEval dataset to achieve a high accuracy of approximately 89%.
- Demonstrated the efficacy of the developed models, highlighting the need to address this important issue and providing a foundation for the development of more efficient models.
- Contributed to promoting a more respectful and inclusive language use towards vulnerable communities in various text settings using the project.

PUBLICATION

Comparative Analysis of different Convolutional Neural Network Algorithms for Image Classification
IJRASET - Volume 8, Issue IX, September 2020 H. Agrawal, M. Kalantri, A. Bansal

CERTIFICATIONS

Deep Learning Specialization Coursera
TensorFlow Developer Specialization Coursera
Python Specialization Coursera
Professional Automation Anywhere (v11) Developer Automation Anywhere