Sarthak Dalal

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EDUCATION

Rutgers University — New Brunswick, NJ
Master of Science in Computer Science (GPA: 3.9/4.0) — Expected: May 2024
Relevant Coursework: Introduction to AI, Data Structures and Algorithms, Mathematical Foundations of Data Science, Database Systems for Data Science, Machine Learning, Computer Vision

Dwarkadas J Sanghvi College of Engineering — Mumbai, India
Bachelor of Engineering in Electronics and Telecommunications (CGPA: 8.86/10) — Aug 2018 – May 2022
Minors in Artificial Intelligence and Machine Learning
Relevant Coursework: Structured Programming Approach, OOP using Java, Database Management System, Machine Vision, Big Data Analytics

Certificates: Algorithmic Toolbox (*UC San Diego, Coursera*) | Bootstrap 4 (*The Hong Kong University of Science and Technology, Coursera*) | Interactivity with JavaScript (*University of Michigan, Coursera*) | Programming for Everybody (*University of Michigan, Coursera*)

SKILLS

ML Frameworks and Libraries	Web Technologies	Databases	Programming Languages
TensorFlow, scikit-learn, Keras, Pandas	HTML, CSS, Bootstrap, Flask, NodeJS	SQL, MongoDB	C, C++, R, Java, Python, JavaScript

WORK EXPERIENCE

Rutgers University — Sept 2023 (current)
Teaching Assistant
- Recitation Instructor for CS170: Computer Application for Business, overseeing two sections with a combined enrollment of 46 students.

PipeIQ — Jun 2023 – August 2023
Machine Learning Intern
- Engineered a customer-centric chatbot utilizing prompt engineering and LangChain technologies. The chatbot seamlessly integrates into client websites, bolstered by PipeIQ backend, enhancing user interaction.
- Spearheaded the development of a robust FastAPI endpoint to host the PipeIQ backend on AWS Elastic Beanstalk, ensuring optimal performance and scalability for the chatbot, resulting in improved user experiences.
- Implemented strategic analytics integration using Google Tag Manager, incorporating Google Analytics, DealFront, and PeopleDataLabs onto the PipeIQ website. Leveraged PeopleDataLabs Data and reverse IP lookup to identify and personalize user interactions, a pivotal technology now integral to the chatbot's functionality.

Indian Institute of Technology - Delhi — Jun 2021 – Apr 2022
Machine Learning Research Intern
- Investigated the application of Artificial Intelligence and Natural Language Processing in the Indian Judiciary System and how AI may be used to augment the judiciary.
- Implemented several summarization models (LexRank, Latent Semantic Analysis, T5, Bart-large-CNN) using Machine Learning and Deep Learning to summarize lengthy case documents which were 30% the length of the original documents and compared the results.

Gravitas AI — Nov 2021 – Jan 2022
Research Intern and Content Editor
- Researched and catalogued content based on Cancer in a meaningful and structured manner which could be used in designing AI based solutions in the field of Oncology such as developing a chatbot which gives information about cancer.
- Designed detailed Conversation Flow designs for cognitive implementations.

The Tann Mann Foundation — Jun 2021 – Aug 2021
Intern
- Developed a Lottery System page using JavaScript and Firebase which handles a database of users and generates a random lucky winner.
- Integrated the Raspberry Pi Cam to Raspberry Pi to develop a face recognition system using OpenCV.

PROJECTS

Optimizing Energy Efficiency: A Comprehensive Analysis of Household Electricity Consumption — March 2024 – May 2024
- Developed machine learning models to predict household electricity consumption, using time-series analysis to enable data-driven decisions for energy savings. Implemented various models including Polynomial Regression, XGBoost, Random Forest, and CatBoost, with Random Forest achieving the lowest RMSE.
- Enhanced model insights by integrating findings into a user-friendly interface using the Django framework, facilitating real-time energy consumption predictions to promote efficient energy use and cost savings.

Age, Gender and Ethnicity Prediction — May 2023
- Developed an image classification system using deep learning techniques to predict age, gender, and ethnicity from uploaded images.
- Trained the models on a labeled dataset containing images representing various age, gender, and ethnicity groups.
- Developed a Flask web application to provide an interactive user interface for image upload and prediction.
- Integrated the trained models into the Flask app, allowing users to upload an image and receive predictions for age, gender, and ethnicity.

BidBazaar Feb 2023 – Apr 2023

- An auction website like eBay, with features like user account creation, auctions, browsing and advanced search functionality, and admin and customer representative functions.

Two-Way Real-Time Sign Language Recognition using Convolutional Neural Network Feb 2023 – Apr 2023

- Developed a Two-Way Real-Time Sign Language Recognition system using a Convolutional Neural Network (CNN) for American Sign Language (ASL) and Indian Sign Language (ISL).
- Used a dataset with 140 images for each sign for both language systems, used skin detection and hand segmentation techniques to isolate the hand region from the background.
- Implemented CNN for classification of signs and achieved an accuracy of over 90% on the test set.

Fast Trajectory Replanning Sep 2022 – Oct 2022

- Led a team of 3 in developing a maze-solving application using the A* search algorithm that enables an agent to navigate a 101x101 grid maze with obstacles to reach a target cell using the shortest route, with a Manhattan distance heuristic.
- Implemented and tested backward A* search and adaptive A* search algorithms, comparing their execution times to forward A* search.
- Created an interactive graphical user interface using the pygame module to visually display the shortest path the agent takes to reach the target.

Battery Management and Data Analytics of Battery and Vehicle Data Sep 2021 – Apr 2022

- Led a team of 4 in designing a Data Acquisition System and Battery Management System and integrating it into the brain of the vehicle, (Vehicle Control Unit) to create a robust electronics system for an Electrics Vehicle.
- Prepared Machine Learning models such as Gradient Boosting, Random Forest, LASSO Regression to predict the SOC (State of Charge) of the battery of the vehicle. Gradient Boosting achieved the best R2 score of 0.977.

PUBLICATIONS

LexRank and PEGASUS Transformer for Summarization of Legal Documents May 31, 2022

Machine Intelligence and Signal Processing (MISP)

- The research paper presented a novel method of abstractive summarization of legal documents using LexRank algorithm and PEGASUS Transformer.
- The summaries generated by this method outperformed 5 other methods tested on 6 documents by achieving a ROUGE-F1 metric of 0.689.
- Awarded the **Best Paper** in the presented track at MISP, 2022.

A Comparative Study on Sign Language Recognition Methods Sep 09, 2022

3rd International Conference on Sustainable Expert Systems (ICSES), IEEE

- The review paper compared different sensor-based and vision-based approaches to Sign Language Recognition using ML.

Arbitrage in Cryptocurrency: A Survey Oct 22, 2021

5th International Conference on Information Systems and Computer Networks (ISCON), IEEE

- The paper deals with using arbitrage in cryptocurrencies over three exchanges and analyzing the profit created over a particular time frame.

EXTRACURRICULARS

Elected as a low voltage systems engineer for team DJS Racing, a formula student team at Dwarkadas J Sanghvi College of Engineering that manufactures Electric formula one type race cars – The team secured Fourth position in Engineering Design Category at Formula Bharat 2021 and received the Best Powertrain package award at FSEV Concept Challenge 2020. Trained juniors to ensure smooth knowledge transfer.