RISHABH NANAWATI

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EDUCATION

Johns Hopkins University | Master of Science in Computer Science — Expected Dec 2024
– Relevant Coursework: Computer Vision, Natural Language Processing, Parallel Computing for Data Science

NMIMS University | Bachelor of Technology (Honor) in Computer Engineering — Aug 2021
– Relevant Coursework: Data Warehousing and Mining, Business Analytics, Sequence Models for Time Series
– Honors: Fellowship by Resolution Project, Student Ambassador Award, 2nd in coding competition Runtime T.

SKILLS

Programming Languages: Python, MATLAB, C++ | Familiar: R, SQL, Java, C, HTML/CSS, Javascript
Developer Tools: Docker Containers, Visual Studio Code, R Studio, JupyterLab, Weights and Biases, Git
Libraries: Seaborn, Scikit-Learn, PyTorch, TensorFlow, LangChain, OpenCV, SpaCy, Flask, Pinecone, MongoDB

EXPERIENCE

Curriculum Developer for Generative AI | Johns Hopkins University — May 2023 – Present
– Curating syllabus, creating lecture presentations, and, crafting hands-on assignments for course “Generative AI”
– Researching LLM fine-tuning techniques including Prompt Engineering, PEFT, RLHF, and metrics such as BLEU
– Creating experiential homework assignments in applying LLMs such as LLaMa-2 and GPT-4 through LangChain

Computer Vision Engineer | Xtractor Lab, Johns Hopkins University — May 2023 – Present
– Spearheading development of "Table Processing" module on historical printed documents which eroded over time
– Implementing open-source models like Microsoft’s TATR and closed-sources like AWS Textract for table extraction
– Creating end-to-end pipeline for table extraction benchmarking, with metrics like mAP, GriTS, for use-case dataset

NLP Engineering Associate | Dimensionless Technologies — Feb 2022 – Sep 2022
– Designed NLP module for real-time Hindi-language call analysis app to detect common telephonic scams in India
– Applied Spacy to pre-process text, BERT for embeddings and cleaned Hindi speech dataset for model fine-tuning
– Reduced Hindi speech-to-text's word-error-rate from 24% to 7%, improving overall performance from 71% to 83%

Chief Engineer, Co-founder | Curabit — Jan 2020 – Dec 2022
– Founded a venture to aid in treatment of moderate psychological disorders using virtual reality exposure therapy
– Curated 7 virtual reality simulations and created a web-based application to control the simulations in a VR headset
– Published technical chapter “Use of Virtual Reality in Exposure Therapy and Other Such Treatment Methods” in book “Multimedia Computing Systems and Virtual Reality”, describing our product’s foundational research (link)

PROJECTS

TREC Spotify Podcast Retrieval — Project Repository
– Retrieved specific podcast episodes based on user’s given search query, according to TREC challenge guidelines
– Processed transcript dataset, transformed into text embeddings, and retrieved them using hierarchical clustering
– Trained and tested model on JHU’s High-Performance-Computing system, and achieved an nDCG score of 0.42

SageRef: Single Image Reflection Removal — Project Repository
– Removed aberrations including glares, flashes and reflections from shiny surfaces, with input of only one image
– Used image processing techniques with a variational autoencoder to segregate reflection and underlying layers
– Achieved 79% of structural similarity index (SSIM) with SIR2 dataset, a collection of 600 synthetic single images

Deep Compression Autoencoder — Project Repository
– Compressed jet particle data from CERN’s ATLAS experiments, as part of Google’s Summer of Code Challenge
– Experimented with various autoencoder architectures to perform compression, after transforming and loading data
– Resulted in 99.8% lossless compression by reducing jet event data from 4 momentum component variables to 3