Anush Kumar Venkatesh

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Education

University of Colorado Boulder **August 2022 – May 2024**
Master of Science in Computer Science, GPA : 4.0 *Boulder, U.S.A*

Ramaiah Institute of Technology **August 2015 – June 2019**
B.E in Information Science and Engineering, CGPA : 9.48 *Bengaluru, India*

Technical Skills

Languages/ Frameworks: Python, Java, HTML/CSS, JavaScript, Pytorch, GoLang, React.js, Node js
Technologies: Git, GitHub, Apache Kafka, Oracle SQL, Mongo DB, Neo4j, AWS, Kubernetes

Experience

Software Engineer Intern **May 2023 – August 2023**
The Mathworks, Inc *Natick, U.S*

- Coordinated with UX teams to redesign an existing MATLAB toolbox UI, addressing 4 key end-user pain points.
- Implemented a versatile front-end application using modern JavaScript standards, supporting and dynamically rendering 20+ custom UI widgets based on backend data.
- Identified 10+ bugs in MATLAB codebase's beta version through collaboration with SRE teams, and thereby improved software reliability pre-release.

Associate Software Engineer **January 2019 – July 2022**
J.P.Morgan & Chase *Bengaluru, India*

- Collaborated with cross-functional teams to develop a heuristic and simulation-based credit risk calculator in Python. This tool efficiently computed the risk associated with over 3000 clients the firm trades on a day-to-day basis.
- Optimized the distribution logic for processing data in parallel and reduced execution time by 4 hours.
- Worked jointly to architect the integration of Kafka for data ingestion for the firm's data lake platform. The effort streamlined the process of data reads and reduced the number of Oracle DB tables needed to be maintained by 40%.
- Helped migrate existing codebase from Python 2.7 to Python 3.6 to ensure long term support.
- Implemented Python scripts to verify code compatibility checks with Python 2.7 and Python 3.6. It ensured production readiness and future-proofing new code before merging.
- Participated in a team-wide event to bring up the code test case coverage to 70%.
- Spearheaded a five-person team to train a Reinforcement Learning model as part of the AWS deep racer program internal to the firm. The group stood sixth, competing with over 100 participating teams.

Summer NLP Intern **June 2018 – August 2018**
Stride.ai Inc *Bengaluru, India*

- Worked jointly in developing a web scraping tool using python to efficiently and automatically download publicly available documents for annotations, leading to a 5-hour reduction in weekly manual effort.
- Collaborated with the team to train a Semantic Role Labeling model for financial data. Led the effort to improve the F1 score from 87.5 to 91.67 by performing a feature ablation study.

Projects

Effective Prompting for Visual Question Answering (VQA) | *Python, Pytorch, HuggingFace* | **April 2024**

- Defended Master's thesis on evaluating the effectiveness of using several prompting techniques on 3 foundational VQA models (Blip2, InstructBlip, and OpenFlamingo) to (1) identify ambiguity (2) identify whether answers ground to the same location (3) produce correct and diverse set of answers for the same visual question to mimic human responses.
- Achieved a 5% increase in model accuracy for VQA by leveraging image captions for contextual prompts and implementing a prompt calibration technique on the LLM component of the foundation models.

HyperParameter Tuning as a Service | *Python, React.js, Kafka, MongoDB, Kubernetes, GCP* | **December 2023**

- Built a web app for parallelized hyper-parameter tuning of ML models on the GCP for custom user datasets, resulting in a 30% reduction in training time compared to a single machine.
- Developed APIs in the backend to process incoming job requests, showcase ongoing and historically completed jobs for users. Configured Kafka to ensure efficient message passing between services.

- Wrote scripts to containerize every service and deploy them on Google Kubernetes Engine.

Connected Papers on Arxiv Web App | *GoLang, React.js, Neo4j, Kubernetes, GCP* | **April 2023**

- Collaborated with a team of 6 to design the architecture of a web app and display the citation network for a given research paper in arXiv to the user. It aided in 20% quicker and easier exploration of connected research papers.
- Designed the data model to store metadata about research papers in Neo4j.
- Led the development of backend service in GoLang to parse over 10000 research papers and builds a graph of all related influential papers and stores the result in Neo4j.
- Worked towards automating the CI/CD pipeline using Github actions and Terraform to deploy the application on Google Cloud Platform.

Machine Translation for Low-Resource Languages | *Pytorch* | (publication) **May 2019**

- Devised a novel data augmentation approach that used an unsupervised statistical machine translation model to produce additional synthetic parallel corpus in the cases of low-resource languages.
- Improved the BLEU scores for supervised neural machine translation by 3 points on the English-Russian low-resource language pair with the additional data.
- Published the findings at Recent Advances in Natural Language Processing, 2019, where I first authored.

Soft-Braille Desktop App | *Python, PyQt* | **July 2018**

- Created a desktop app to assist teachers in automatically translating an English textbook to its Braille equivalent, helping in an 80% conversion of primary school materials.
- Introduced an innovative algorithm to represent edges of an image with Braille characters to mimic tactile graphics.
- Recognized with Inspiration award by Ministry of Social Justice, Govt of India.