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Pranav Prabhu

SUMMARY

- 1+ years of experience in Full Stack Development with a strong understanding of Frontend and Backend technologies
- 1 year of industry experience and 4 years of academic experience in Software Development and Data Analytics
- Extensive knowledge of the MERN stack, server/client-side scripting, and use of REST APIs
- Knowledgeable about software methodologies such as Agile/Scrum, Waterfall, and Project Management principles
- Familiarity with programming languages such as Python, Java, ReactJS, NodeJS, HTML/CSS, and R
- Proficient in database technologies including RDBMS (MySQL/SQL Server) and NoSQL (MongoDB)
- Extensive knowledge of Windows and Linux (Debian/Ubuntu, RHEL/Fedora) Operating Systems
- Knowledgeable in Data Analytics methodologies such as Distance Metrics, Clustering (hierarchical, partitioning, density), Regression, Dimension Reduction (PCA, MDS), Web Scraping, Sentiment Analysis, and Vector Space Model
- Familiarity with Data Visualization tools such as Splunk, Tableau, and Jupyter
- Proficient with Cloud/Containerization technologies such as AWS (EC2, S3, IAM, RDS, DynamoDB, etc.) and Docker
- Extremely organized and self-driven individual with a passion for Software Development, Machine Learning, and IT

SKILLS

- **Languages:** Python (5 yrs), Java (3 yrs), HTML/CSS (5 yrs), ReactJS/ExpressJS/NodeJS (2 yrs), SQL (3 yrs), R (1 yr)
- **Tools & Technology:** Linux - Debian/Ubuntu, Fedora (3 yrs), AWS (1 yr), Docker (2+ yrs), Jenkins (1 yr), JIRA/Confluence (1+ yrs), Git/GitHub (3+ yrs), REST APIs (1+ yrs), Selenium (1 yr), Splunk (1 yr), Tableau (1 yr), MS Office (7+ yrs)
- **Frameworks:** Pandas, NumPy, Matplotlib, Scikit-Learn, Django, Flask, Tensorflow, Svelte
- **Scripting Languages & DBMS:** Python, GNU Bash, MySQL, SQLite, SQL Server, PL/SQL, GraphQL, PostgreSQL, MongoDB
- **Network Technologies:** LAN topologies, routers, VPN (OpenVPN, IPSec), OSI Model, Cisco Packet Tracer, Wireshark
- **Certifications:** CompTIA ITF+, Microsoft Certified Azure Fundamentals, AWS Cloud Practitioner

EXPERIENCE

Software Engineer | Tysons, VA | Contractor to GSA   **July 2024 - Present**
CloudWave Inc.

- Fostered the migration of a multisite infrastructure for GSA from on-premises to AWS ensuring a seamless lift-and-shift transition with minimal downtime and enhanced scalability. Designed and developed a cloud-based multisite infrastructure for acquisition.gov and fai.gov, working within a team to migrate legacy on-prem systems to AWS using services such as EC2, Fargate, EFS, ALB, and RDS. Implemented scalable and fault-tolerant solutions to ensure high availability, security, and reliability, reducing infrastructure maintenance overhead & enabling seamless content delivery.
- Engineered containerized environments using Docker to package and deploy applications efficiently, integrating GitHub Actions for CI/CD automation. This improved deployment speed, minimized configuration drift, and streamlined infrastructure updates, significantly reducing manual intervention while ensuring consistency and reproducibility across development, staging, and production environments.
- Implemented and optimized Solr for search discovery and content indexing, enhancing data retrieval efficiency and site responsiveness across multiple domains. Tuned Solr configurations, query optimizations, and indexing strategies, leading to faster and more relevant search results, and improving user experience and accessibility for key stakeholders.
- Developed and maintained a Drupal-based codebase with PHP, JavaScript, MySQL, and PHPMyAdmin, customizing backend functionalities and front-end components to support complex content workflows. Integrated AWS services with Drupal to improve database performance, file storage efficiency (EFS), and API responsiveness, enhancing content management and user engagement.
- Collaborated closely with cloud engineers, DevOps, system administrators, and security teams in an Agile/Scrum environment to ensure secure, compliant, and highly available government web applications. Participated in sprint planning, code reviews, and troubleshooting, contributing to the successful modernization of critical digital services used by federal agencies and the public.

Software Engineer Intern | Alexandria, VA   **May 2023 - August 2023**
Walmart Inc.
• Engineered and optimized RESTful APIs using Node.js, Express.js, and PostgreSQL, enhancing backend data retrieval efficiency by 30%, and improving checkout and order tracking functionalities for Walmart's e-commerce platform.
• Developed dynamic and responsive UI components using React.js, HTML, and CSS, enhancing the customer experience for millions of online shoppers by reducing page load times by 25% through front-end performance optimization.
• Implemented automated test suites using Selenium and Jest, improving code reliability by 40% and reducing manual QA efforts, ensuring seamless deployment of features without regressions.
• Designed and deployed a CI/CD pipeline using Jenkins and Docker, accelerating deployment cycles from weekly to daily releases, improving developer productivity, and minimizing downtime for high-traffic e-commerce services.
• Collaborated with cross-functional teams to migrate legacy SQL databases to AWS RDS, improving query performance by 35%, ensuring data integrity, and enhancing Walmart's ability to handle high-volume transactions efficiently.

Software Developer Intern | New York City, NY   **May 2022 - August 2022**
Amplitude Inc.
• Collaborated with a team of interns to create a business management consulting website with cloud storage integration, enhancing overall business efficiency, and implemented software where large data is transformed in a user-friendly manner using full stack technologies such as HTML/CSS, React.js, Python, and AWS RDS.
• Utilized HTML, CSS, and JavaScript to incorporate features like an algorithmic search and a forum section for our Qualitative Data Analysis product, optimized MySQL database size with custom scripts for enhanced product functionality, and oversaw bug testing using JIRA, streamlining team's issue resolution process.
• Developed and Implemented a Cloud Formation Template with a hook to validate Security Groups, and implemented validation modules for EC2 instances images and S3 Bucket.
• Implemented advanced data handling and visualization techniques utilizing Pandas, NumPy, and Tableau for real-time data analysis, driving insights, and improving decision-making tools by effectively using SQL and Python scripting.
• Developed and maintained API endpoints and complex SQL queries, improving system integration and data exchange capabilities, supported by a deep understanding of RDBMS, containerization, & AWS to ensure scalable and secure apps.

PROJECTS

Bragi | *Python, Bash Scripting, React.js*   **July 2024 - Present**
• Developed a real-time audio advertisement recognition web app (Bragi) using React.js that accurately detects ads within audio streams using machine learning models with a high precision rate, enhancing the user experience for platforms like Spotify and YouTube/YouTube Music.
• Designed and implemented a deep learning model using Keras, with a convolutional neural network (CNN) architecture, achieving high accuracy for ad/music classification from segmented audio input sampled at 200ms intervals.
• Integrated ALSA loopback devices on Linux for real-time audio capture, enabling the simultaneous playback of sound through speakers and recording for analysis, streamlining the detection pipeline for both user-uploaded and live audio streams, and providing graph-based visual feedback of detection accuracy over time.
• Engineered a system to adjust volume levels automatically based on real-time ad detection, lowering the volume for ads and increasing it when music or desired content resumes, thus improving user convenience and experience.
• Planned for future scalability by designing an extension compatible with popular streaming platforms, allowing seamless ad detection and volume control integration.

[AutoDoc AI] **|** *Python, Jupyter Notebooks*   **January 2024 - May 2024**
• Developed AutoDoc AI, a sophisticated multi-agent system utilizing large language models (LLMs) for automated code documentation, enhancing developer productivity by generating accurate in-code and external documentation.
• Integrated advanced NLP and NLG techniques, employing tools such as LangChain, LangGraph, and Tree-Sitter, to ensure the system's ability to parse and document Python, JavaScript, and Swift codebases effectively.
• Implemented agents capable of dynamic code analysis and iterative documentation refinement, resulting in clear, consistent, and up-to-date documentation for various software development stages.

• Demonstrated the system's effectiveness through comprehensive command-line interface (CLI) demonstrations, showcasing its ability to generate both inline code comments and detailed Markdown documentation.
• Conducted extensive user testing and iterative improvements, incorporating feedback from developers and QA professionals to enhance the system's usability, robustness, and integration with popular development environments.

[Automatic Video Captioning](#) | *Python, Jupyter Notebooks*   **January 2024 - May 2024**
• Implemented CNN-LSTM and LLaVA models to generate textual descriptions for videos, assessing performance on the MSVD dataset with adversarial examples to evaluate robustness.
• Calculated BLEU, ROUGE-L, and METEOR scores to quantitatively assess model performance, showing CNN-LSTM's superior unigram matching and LLaVA's strength in sentence structure and semantics.
• Demonstrated that both CNN-LSTM and LLaVA models maintain performance with minimal degradation when exposed to adversarial examples, highlighting their robustness.
• Conducted thorough qualitative analysis to compare generated captions with reference captions, revealing LLaVA's superior ability to produce coherent and contextually accurate descriptions.
• Benchmarked results against state-of-the-art models VALOR and mPLUG-2, showing how increased model complexity and multimodal approaches significantly improve caption quality.

[Credit Card Fraud Detection](#) | *Python, Jupyter Notebooks*   **January 2024 - May 2024**
• Developed and implemented various machine learning models, including Logistic Regression, K-Nearest Neighbors, Support Vector Machines, and Decision Trees, to identify fraudulent credit card transactions.
• Performed data preprocessing and scaling, handled imbalanced data using random undersampling and SMOTE oversampling, and ensured robust model training and evaluation using cross-validation techniques.
• Achieved high model performance metrics with AUC-ROC scores above 0.90 for all classifiers, demonstrating a strong ability to distinguish between fraudulent and non-fraudulent transactions.
• Conducted hyper-parameter tuning using RandomizedSearchCV and GridSearchCV, optimizing model performance and achieving a balanced trade-off between precision and recall.
• Demonstrated the effectiveness of SMOTE oversampling in enhancing model sensitivity and accuracy, leading to improved detection of fraudulent transactions while maintaining a robust generalization to unseen data.

[VT Marketplace](#) | *MERN (MongoDB, Express.js, React.js, Node.js)*   **August 2023 - December 2023**
• Designed and developed VT Marketplace, an online marketplace exclusive to the Virginia Tech community for local buying and selling, leveraging the MERN Stack for a responsive and interactive user experience, earning my team third place for the best overall Hackathon project of the year at my university.
• Implemented a comprehensive user authentication system, along with features for creating and managing user posts and profiles, advanced search and filters, real-time messaging, secure payment gateway, analytics features for sellers, and comprehensive FAQ and Help section utilizing Node.js in the backend.
• Integrated marketplace functionalities including listing management, user settings customization, ratings, and review system, the ability to handle various product categories, and various community features & resources.

EDUCATION

Bachelor of Science in Computer Science | Virginia Tech, Blacksburg, VA, USA   **August 2020 - May 2024**
Overall GPA: 3.82, In-major GPA: 3.80
• Graduated with "Summa Cum Laude" Honors Distinction
• Relevant Coursework: Advanced Data Structures & Algorithms (Java), Data Analytics (Python), Docker, Database Systems, Cloud Software Development, Advanced Statistics, AI & ML, and Operating Systems (C Programming).