AARTHI VASUDEVAN

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Seeking Full-time ML/AI and SDE positions from June 2024 with 3+ years of experience; Willing to Relocate.

EDUCATION

Texas A&M University, College Station, USA   **Aug 2022 - May 2024**
Master of Science in Computer Engineering   *CGPA: 3.8/4*
- **Courses**: ML, AI, Data Mining, Distributed Systems and Cloud Computing, Analysis of Algorithms, Information Storage and Retrieval

SSN College of Engineering, Anna University, Chennai, India   **June 2016 - April 2020**
Bachelor of Engineering in Electronics and Communication   *CGPA: 9.16/10*
- **Courses**: Object-oriented programming, Database Management Systems, Web Development, Computer Networks and Architecture

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WORK EXPERIENCE

Texas A&M University   **College Station, USA**
Graduate Research Assistant **| ML, Computer Vision, Python, Node.js, Django, NoSQL, REST APIs, Docker, AWS**   *Sept 2022 – May 2024*
- Implemented ML-driven algorithms for object detection and classification using OpenCV. Achieved a **78% accuracy** rate with a dataset of **20,000** images with feature extraction, image segmentation, and supervised learning.
- Developed and fine-tuned machine learning models for various applications, mainly data analysis. Leveraged Python libraries such as scikit-learn, TensorFlow, and PyTorch, optimized hyperparameters, and utilized cross-validation to ensure robust model performance.
- Executed web scraping on the OSHA website using Python, BeautifulSoup, and Pandas. Extracted and organized **2000** tabulated **records**, and applied data preprocessing techniques to clean and structure the scraped data.
- Engineered full-stack web apps for smart cities and construction using Python, Node.js, NoSQL databases (MongoDB & DynamoDB), & Django and Flask APIs. Dockerized & deployed them on AWS (S3, ECS, EC2, Fargate) with DevOps pipelines (AWS CodeCommit & Git).

Hewlett Packard Enterprise   **San Jose, USA**
Software Engineer Intern **| NLP, LLM, Streamlit, REST APIs, Python, Django, PostgreSQL, React.js, SaaS**   *May 2023 – Aug 2023*

TAPAS (Table-based Pretraining and Answer selection) - based query interface for tabular data
- Optimized and fine-tuned TAPAS, a Bert-based weakly supervised question-answering NLP model to extract insights from Parquet datasets containing system specifications.
- Achieved an accuracy of **83.25%** through rigorous hyperparameter tuning and deployed it as a Python Streamlit application providing an intuitive interface for seamless exploration and analysis.

HPE GreenLake for Private Cloud Business Edition (PCBE) Pricing Calculator
- Built a scalable PostgreSQL database for custom workloads and rate cards, designed efficient React interfaces and leveraged jQuery for smooth user experience (DOM & asynchronous operations).
- Engineered high-speed APIs with Django ORM to power real-time recommendations and dynamic pricing in our innovative SaaS platform, enhancing user engagement and driving business growth.

Tata Consultancy Services   **Chennai, India**
Software Developer **| SaaS, Java, Python, Amazon Web Services, Job Scheduling, Microservices, Cloud Migrations**   *Aug 2020 - Aug 2022*
- Constructed a Java microservices-based crew scheduling system for Carnival Cruise Lines using Spring Boot. Employed the Model-View-Controller (MVC) framework. Implemented a set of pre-defined business rules aimed at optimizing scheduling. Resulted in a **75%** reduction in scheduling **conflicts**, a **15%** boost in crew **productivity**, and a **30%** decrease in **infrastructure** costs.
- Leveraged my data understanding and analysis skills to identify patterns and optimize the system. Implemented automated testing to ensure its reliability and worked within an on-call schedule, demonstrating commitment and responsiveness.
- Engineered serverless AWS applications, harmonizing computing, storage, security and networking services mainly AWS ECS, S3, IAM, CloudFront, ACM, API Gateway, Lambda, DynamoDB, RDS, SQS, and SNS. Configured multiple triggers to schedule jobs leveraging AWS Batch and DynamoDB Streams. Created and deployed AWS CloudFormation templates on varied environments through Azure DevOps.
- Spearheaded the migration of on-premises apps to a hybrid cloud setup using an Agile methodology, collaborating with stakeholders and UI Design, Testing and DevOps teams to build a secure, scalable platform. Crafted reusable code components and optimized application performance for a faster, more responsive experience.
- Developed high-performance back-end services supporting cloud applications using Python (boto3) and Java SDKs, significantly reducing API response times and improving app responsiveness.

Kaashiv InfoTech   **Chennai, India**
Software Developer Intern **| ML, Regression Models, Python**   *May - June 2019*
- Developed a weather forecasting model using linear regression in Python with an **85% accuracy** rate. Conducted data preprocessing and feature engineering to improve model robustness.
- Applied cross-validation and regularization for optimal model performance. Assessed model accuracy using MAE, RMSE, and R-squared metrics.

PROJECTS

tamuGPT | RAG, LLMs, GPT-3, Web crawling, Python, Scrapy   *Apr 2024*
- Spearheaded the development of tamuGPT, a fusion of **RAG-enhanced** GPT-3 with web-crawled data, surpassing vanilla RAG and GPT-3. Demonstrated a significant improvement in information retrieval accuracy by retrieval augmented generation.
- Designed and implemented a user-friendly interface for tamuGPT, allowing for intuitive interactions and seamless integration with various applications, enhancing user accessibility and experience.

Data Mining Project | R Programming, ML   *May 2023*
- Conducted in-depth supervised learning, achieving **72.5% accuracy**, and executed unsupervised learning on complex datasets containing 1000 observations and 780 variables. Utilized advanced ML techniques to extract meaningful insights and patterns from the data.
- Applied feature engineering techniques to enhance model performance and interpretability, resulting in improved accuracy and insights from the dataset.

Prediction of Uber fares | ML, Regression Models, Python   *Dec 2022*
- Analyzed Uber ride datasets and applied a range of regression algorithms to develop a cab fare prediction model. Achieved a **precision** of **90%** by optimizing model parameters and feature selection.
- Implemented advanced data preprocessing techniques, including normalization and scaling, to enhance model convergence and performance. Ensured the model's accuracy and robustness, contributing to reliable fare predictions for Uber rides.

Intelligent Traffic Signal Control System – IEEE Publication | ML, OpenCV, Python   *May 2020*
- Estimated traffic densities using HAAR Cascade classifier and achieved **70% precision**. Designed and implemented an adaptive traffic signal control system, demonstrating proficiency in machine learning and computer vision techniques.
- Utilized real-time data streaming and processing to adapt traffic signals dynamically, reducing congestion and improving traffic flow in the simulated environment.

Parallelizing Strassen's Matrix-Multiplication Algorithm | C++, CUDA, OpenMP, High performance resource computing   *Dec 2023*
- Implemented shared-memory parallelization using OpenMP tasks to optimize recursive calls in Strassen's matrix multiplication algorithm. Conducted performance benchmarking and optimization, achieving significant speedup in matrix multiplication operations compared to sequential algorithms.
- Utilized high-performance computing resources to execute intensive computations efficiently, leveraging distributed computing environments to further enhance performance and scalability.

Event Management Application (EventNXT) | Full Stack Development, Ruby on Rails   *Dec 2022*
- Enhanced a real-time event management application by integrating new features and optimizing r**esponse time by 20%**. Leveraged full-stack development skills and Ruby on Rails framework to deliver an improved user experience. Implemented robust error handling mechanisms to enhance application reliability and user experience, ensuring smooth navigation and minimizing disruptions during usage.

Smart Spying Robot with Thermal Vision – IEEE Publication | Python, Mobile Application, Firebase   *Dec 2019*
- Developed a web app-controlled robot equipped with thermal vision capabilities. Streamed live data over a virtual network and stored timestamped results on the cloud, showcasing proficiency in Python and IoT technologies. Implemented motion control algorithms to enable precise and responsive movement of the robot, enhancing its navigational capabilities and user control.

TECHNICAL SKILLS
- **Machine Learning** Pandas, PySpark, Numpy, Keras, Tensorflow, PyTorch, NLP, LLMs, BERT, RAG, Transformers, TAPAS
- **Programming & OS** C++, Python, Java, C, R Programming, Data Structures, Ruby, Linux
- **Cloud Platforms** AWS, Microsoft Azure, Docker, Firebase
- **Web Development** RESTful APIs, Spring Boot, HTML, CSS, JavaScript, Node.js, React, Django, Flask, Streamlit
- **Data Mining** Statistical Analysis, Classification, Regression, Data Processing, Modeling
- **Databases** MySQL, NoSQL, PostgreSQL, DynamoDB, MongoDB
- **CI/CD** GitHub, Azure DevOps, AWS CodeCommit

CERTIFICATIONS AND COURSES
- **AWS Certified** Developer – Associate   *2022*
- **Microsoft Certified** Azure Fundamentals, Azure Data Fundamentals & Azure AI Fundamentals   *2022*
- **Udemy** Python for Data Science and Machine Learning Bootcamp, DevOps, CI/CD for Beginners   *2021*
- **Coursera** SQL for Data Science, Neural Networks and Deep Learning   *2020*
- **NIIT Certified** C Programming   *2016*

AWARDS AND ACHIEVEMENTS
- 'Star of the Quarter Award', Tata Consultancy Services   *2022*
- 'Academic merit scholarships', SSN College of Engineering & 'University Rank Holder', Anna University   *2021*