# AARTHI VASUDEVAN

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Graduate student with 3+ years of experience seeking AI/ML and SDE roles; graduating May 2024 and willing to relocate

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## EDUCATION

**Texas A&M University, College Station, USA**                                    **Aug 2022 - May 2024**

*Master of Science in Computer Engineering*                                         *CGPA: 3.9/4*

- *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*

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## WORK EXPERIENCE

**Texas A&M University**                                                          **College Station, USA**

*Graduate Research Assistant* **| ML, Computer Vision, Python, Node.js, Django, Flask, NoSQL, REST APIs, S3**        *Sept 2022 – Present*

- Implemented ML-driven algorithms for object detection and classification using OpenCV. Achieved a 78% accuracy rate with a dataset of 20,000 images by applying techniques such as feature extraction, image segmentation, and supervised learning to enhance model performance.
- 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 for further analysis and model training.
- Engineered numerous full-stack web applications with integrated functionalities. Utilized Python, Node.js, and NoSQL databases like MongoDB and DynamoDB. Implemented RESTful APIs using Django and Flask frameworks to enable seamless interactions.

**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***

- Managed the optimization of TAPAS, achieving an accuracy rate of 83.25% by fine-tuning hyperparameters. Applied the model to systematically analyze and extract key insights from complex system specifications, improving data interpretation and decision-making processes.
- Developed a user-friendly Python Streamlit application to deploy TAPAS, offering stakeholders an intuitive platform for interactive data exploration, visualization, and analysis. Demonstrated a strong aptitude for integrating advanced technology with practical applications, enhancing both data analytics capabilities and user experience.

***HPE GreenLake for Private Cloud Business Edition (PCBE) Pricing Calculator***

- Leveraged PostgreSQL to architect a scalable database tailored for custom workloads and rate cards, ensuring unparalleled data integrity and optimal performance.
- Engineered high-speed APIs with Django ORM, achieving a 50ms response time. Seamlessly integrated with React to power real-time recommendations and dynamic pricing in our innovative SaaS platform, elevating 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 SaaS crew scheduling system with Spring Boot for Carnival Cruise Lines, built and documented the APIs, delivering a 75% drop in scheduling conflicts, boosting crew productivity by 15%, and reducing infrastructure costs by 30%.
- 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.
- Led the migration of heavy on-premises applications to a hybrid cloud infrastructure, while also developing a robust cloud platform for seamless integration and scalable performance improvements.
- Developed sophisticated back-end services supporting SaaS cloud applications using Python (boto3) and Java SDKs, contributing to a notable decrease in API turnaround and a commendable improvement in overall application 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 cutting-edge fusion of RAG-enhanced GPT-3 with web-crawled data, surpassing vanilla RAG and GPT-3 by leaps and bounds. By seamlessly integrating external knowledge retrieval with generative capabilities tamuGPT boasts a remarkable improvement in information retrieval accuracy.
- 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 an impressive 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. Demonstrated strong programming skills in C++ and parallel computing to enhance algorithm efficiency. 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 response 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, 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*