

# AARTHI VASUDEVAN

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Seeking Full-time SDE positions from June 2024 with 3.5+ 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: 3.9/4

• Courses: Distributed Systems and Cloud Computing, Analysis of Algorithms, Information Storage and Retrieval, ML, AI, Data Mining

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

## WORK EXPERIENCE

Texas A&M University

College Station, USA

Graduate Research Assistant | Python, Java, PostgreSQL, REST APIs, React, Node.js, AWS, ECS, Web Scraping, ML Sept 2022 – Present

- Developed a Java MVC web application for a senior citizen safety initiative. Calculated the shadow matrix based on sun's position at every 30 minutes and combined the results with real-time weather data. Utilized PostgreSQL database to store the information and used them to recommend well-lit routes on a React-based interactive map. Ensured unit testing throughout the development using JUnit framework, guaranteeing code quality and reliable functionality.
- Engineered numerous full-stack web applications for smart cities and construction communities utilizing Python, Node.js, NoSQL databases mainly MongoDB and DynamoDB, Django and Flask frameworks for RESTful APIs. Dockerized and deployed them on AWS S3, ECS, EC2, and Fargate. Established DevOps pipelines using AWS CodeCommit and Git as version control systems.
- Managed end-to-end ownership of legacy 3D model project, performed integration testing, and deployed the model on AWS optimizing latency by 60% and deployment cost value by 65%.
- 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.
- 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.

Hewlett Packard Enterprise

San Jose, USA

Software Engineer Intern | REST APIs, Python, Django, PostgreSQL, React, NLP, LLMs

May 2023 – Aug 2023

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 data integrity and optimal performance. Utilized React to develop efficient front-end interfaces and manage application state. Leveraged jQuery to streamline DOM manipulation and handle asynchronous operations for a smoother user experience.
- Engineered high-speed APIs with Django ORM, achieving a 50ms response time. Integrated with React and jQuery to power real-time recommendations and dynamic pricing in our innovative SaaS platform, enhancing user engagement and driving business growth.

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 a structured dataset of 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.

Tata Consultancy Services

Chennai, India

Software Developer | Java, Spring Boot, Python, AWS, 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 strong 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.
- Demonstrated expertise in architecting serverless applications on AWS. Orchestrated a complex ecosystem of services including ECS for containerization, S3 for storage, IAM for access control, CloudFront for content delivery, and more services. Utilized AWS CloudFormation templates for infrastructure provisioning and deployed them across environments via Azure DevOps.
- Spearheaded the migration of on-premises apps to a hybrid cloud setup, 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, contributing to a notable decrease in API turnaround and a commendable improvement in application responsiveness.

Kaashiv InfoTech

Chennai, India

Software Developer Intern | ML, Regression Models, Python

May - June 2019

- Built an 85% accurate weather forecasting model in Python using linear regression. Preprocessed data and engineered features for robustness, employing cross-validation and regularization for optimal performance. Evaluated with MAE, RMSE, and R-squared metrics.

PROJECTS

- Customer Relationship Management (CRM) System | Java, Spring Boot, MVC, Hibernate, MySQL, Security management

Dec 2020

  - Developed a secure, role-based CRM using Spring MVC, Java, and Hibernate for smooth database interaction. Implemented secured login (Spring Security), encrypted passwords (bcrypt hashing), and enabled granular access control to manage customer data. Leveraged MySQL for customer data storage.
- Modern & Tech-Forward | RESTful APIs, PostgreSQL, Node.js, React, User authentication

Mar 2022

  - Structured a robust PostgreSQL schema for reliable storage of user data, course content (text, video), progress, and gamification elements. Built a RESTful API for user auth, course management, data access, and recommendations. Leveraged Node.js for real-time features: interactions, recommendations, and notifications.
  - Developed a dynamic and user-friendly interface with React.js for user profiles, course interfaces, video playback components, and social interaction features. Integrated gamification elements like badges and points using React to enhance user engagement.
- Smart Spying Robot with Thermal Vision – IEEE Publication | Python, Mobile Application, Virtual Network, 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.
- 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.
- 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.

TECHNICAL SKILLS

• Programming & OS	Java, Python, C++, C, R Programming, Data Structures, Ruby, Linux
• Web Development	RESTful APIs, Spring Boot, MVC, Hibernate, HTML, CSS, JavaScript, Node.js, React, jQuery, AJAX, Django, Flask, Streamlit
• Cloud Platforms	AWS, Microsoft Azure, Docker, Firebase
• Machine Learning	Pandas, PySpark, Numpy, Keras, Tensorflow, PyTorch, NLP, LLMs, BERT, Transformers, TAPAS
• 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	Full Stack React Js with Redux, Node.Js, Express.Js, MongoDB	2021
	The Complete 2024 Web Development Bootcamp : HTML, CSS, Javascript, Node, React, PostgreSQL	2020
	Python for Data Science and Machine Learning Bootcamp, DevOps, CI/CD for Beginners	2020
• Coursera	Spring MVC, Spring Boot and Rest Controllers	2020
	SQL for Data Science, Neural Networks and Deep Learning	2020

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