

# Manoj Kumar Nallamala

☎ 469-514-9685 | ✉ manojnallamala98@gmail.com | [in ManojNallamala](#) | [G Manoj-kumar-Nallamala](#) | [G Portfolio](#)

## EDUCATION

### University of Texas at Arlington, USA

*Master of Science in Computer Science*

Aug 2022 - May 2024

**GPA : 4/4**

### GITAM University, Vishakhapatnam, India

*Bachelor of Technology in Computer Science*

June 2016 - June 2020

**GPA : 3.73/4**

## TECHNICAL SKILLS

**Languages:** Python, Java, PySpark, PyTorch, C/C++, Scala, Angular, R, JQuery, UML, JavaScript, HTML/CSS.  
**Frameworks:** Hadoop, Spring Boot, Django, Pytest, Junit, Microservices, AngularJS, React, Node.js, CI/CD, Jest  
**Developer Tools:** Git, Docker, Splunk, Jupyter, Linux, Containers, VS Code, Postman, WireShark, Jira, SOAP UI.  
**DataBase/QueryLanguages:** SQL (Postgres), Oracle, GraphQL, MongoDB, Cassandra, AWS DynamoDB, Hibernate.  
**Services / Tools:** Kubernetes, Azure Blob, Data factory, IAM, S3, AWS Lambda, Amazon SageMaker, Azure DataBricks, Azure Synapse Analytics, Apache Airflow, Tableau, IBM Cloud, Redshift, BigQuery, Snowflake.  
**Libraries:** Transformers, SentencePiece, PyTorch, LangChain, CUDA, HuggingFace, Seaborn, NLTK, OpenCV.

## EXPERIENCE

### Graduate Research Assistant

*Campus AI Concierge* | RAG, Qdrant Vectors, Databricks, JAX, MLOps, CUDA

Aug 2023 – May 2023

*Texas, USA*

- Led the creation of a university-centric virtual assistant using Microsoft Phi2 SLM and LLaMA-2 7B models, enhancing data-driven communication and resource accessibility across the campus.
- Engineered a RAG (Retrieval-Augmented Generation) architecture, developing data pipelines and APIs to support diverse applications from information retrieval to AI-assisted recommendations, seamlessly integrated with a custom-built faculty database.
- Utilized Qdrant vector database with BPE tokenization to store and retrieve embedded vectors efficiently, optimizing data storage and access for the virtual assistant.
- Developed an auto-prompt suggestion feature using the LangChain library, dynamically generating context-aware follow-up questions to enhance data processing and virtual assistant engagement.
- Developed the project as a mobile application using Django, providing on-the-go access to campus resources and enhancing user experience with dynamic and responsive mobile interfaces.

### Data Engineering Intern

*Kantola Training Solutions* | Azure, Data Architecture, Self Supervised learning

May 2023 - Aug 2023

*Mill Valley, California*

- Engineered a CNN-based machine learning classifier for automatic service ticket classification and assignment, improving response efficiency by 60% and accuracy in customer support operations.
- Developed an end-to-end data pipeline in Azure, which ingests incoming data, preprocesses it in Azure Data Factory, and stores it in Azure Blob Storage.
- Performed ETL operations using Azure Databricks to transform and load data into the machine learning model. The model classifies tickets based on keywords and assigns labels to direct tickets to the appropriate team within the company.
- Utilized Azure Synapse Analytics to analyze and visualize frequent ticket types and their root causes. Created a Tableau dashboard to display these insights, enabling proactive issue resolution and strategic improvements.
- Achieved a 50% reduction in ticket resolution time by optimizing the data pipeline and enhancing classification accuracy through continuous model training and refinement.

### Full Stack Engineering Senior Analyst, Accenture

*Accenture Freight and Logistics Software* | Java, SQL, Azure, Angular, Microservices

June. 2020 - July 2022

*Hyderabad, Telangana*

- Developed a responsive front-end for booking summary and flight details using Angular, TypeScript, TailwindCSS, and Node.js, enabling dynamic adjustments of pricing parameters and enhancing UI/UX design.
- Developed unit tests using JUnit and Mockito, and crafted integration tests for legacy system interoperability.
- Integrated airlines' systems using Azure Service Bus and messaging formats like SSN, FFR, SSE for cargo payloads.
- Developed AngularJS front end for booking summary, flight details, Enabled changing of pricing parameters based on bid price vectors using master screens. Used Custom directives for improving flight capacity dashboard screens.
- Engineered a route recommendation system employing concurrent algorithms to enhance upselling by 13%.

- Implemented Least Connections load balancing and circuit breaker patterns, reducing system failures by 22%
- Optimized route search algorithms and enhanced performance of upsell routes by 15% using custom-designed data structures and multithreading tailored to specific use cases.
- Utilized Dynatrace for effective API health monitoring and configured metrics and alarms of various severities. Developed and maintained GraphQL APIs to streamline data retrieval.
- Implemented flight schedulers and handovers using CRON jobs to handle flight schedules precisely across time zones, ensuring seamless global operations.

## Project Intern, Tata Consultancy Services

May 2019 - July 2019

### *Automatic Question Generator for Cognitive Bot Evaluation* | NLTK, Reinforcement Learning

Hyderabad

- Enhanced cognitive bot's performance by 58% with an NLTK-based text-to-question algorithm using tokenization, POS tagging, and StanfordNER as entity recognizer which generates questions for effective bot training.
- Implemented WordNetLemmatizer for verb conversion and constructed a coreference graph for question framing.
- Developed an innovative algorithm for generating questions from raw text by leveraging NLTK libraries, including wordtokenize and senttokenize for tokenization, and postag for parts of speech tagging.
- Utilized the Stanford Named Entity Recognizer for named entity recognition and employed the WordNetLemmatizer for converting verbs, essential for linguistic processing and categorization within the text.
- Built a coreference graph for identifying pronouns, critical for framing questions in perspective of these pronouns, and designed a customized text parser that integrated multiple named entity recognition algorithms for accurately identifying parts of speech and assigning composite tags to words.
- Applied neural networks and machine learning algorithms for ranking questions, ensuring the selection of high-quality and contextually relevant questions tailored to the input text.

## PROJECTS

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### **Adaptive Lane Detection for Autonomous Driving** | *Python, OpenCV, MLOps*

Jan 2023 - May 2023

- Developed a lane detection algorithm for real-world driving scenarios using Sobel edge detection, sliding window search, and polynomial curve fitting, effectively adapting to variations in lane markings and requiring less computational resources compared to Hough transform-based methods.
- Successfully evaluated and optimized the algorithm to achieve real-time performance with frame rates up to 25.6 frames per second across various lane types on a moderate computational platform, highlighting its suitability for practical applications.
- Demonstrated the algorithm's robustness in handling diverse driving conditions, efficiently balancing accuracy and computational complexity, and implemented visualizations by rendering lanes on original images, indicating its potential utility in advanced driver assistance systems and autonomous vehicles.
- Identified and addressed challenges in detecting discontinuous or missing lane markings, as well as in accurately identifying lanes on curved roads, with provisions for future integration of additional sensor modalities like lidar or infrared for enhancing performance in adverse conditions such as night-time or inclement weather.
- Implemented advanced computer vision techniques including perspective transformation and color thresholding to enhance the accuracy of lane boundary identification.

### **Process Burst Time Prediction Using Machine Learning** | *Reinforcement Learning*

January 2023

- Developed a predictive model using machine learning and reinforcement learning to forecast CPU process burst times, significantly enhancing job scheduling efficiency in CPU architectures.
- Utilized a dual-phase approach to classify CPU processes by type and accurately predict burst times, optimizing the efficiency of the scheduling system.
- Implemented reinforcement learning algorithms for burst time prediction and scheduled jobs using the predicted burst times with the Shortest Job First (SJF) algorithm, reducing average waiting time by 35% and improving overall system throughput.
- Validated predictive models with real-world data to ensure applicability in operational CPU environments.
- Achieved high accuracy in burst time predictions, leading to better resource allocation and enhanced process management within CPU architectures.

## CERTIFICATIONS & ACCOMPLISHMENTS

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- Machine Learning & Deep Learning in from Stanford online by Andrew Ng.
- AWS Certified Solutions Architect - Associate.
- Azure Data Engineer Associate - Microsoft.
- Full Stack Java developer - Java + JSP + Restful WS + Spring from Udemy.
- Generative AI learning by Google.
- Honored with the Accenture Celebrates Excellence award for outstanding performance and contributions.
- Member of Phi Kappa Phi and Tau Beta Pi research honor societies, distinguished for academic excellence.