

# UJWAL KALUVAKOLANU THYAGARAJAN

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## EDUCATION

### University of California Davis

Master of Science in Computer Science, GPA: 4.0/4.0

Davis, CA

June 2025

### Osmania University

Bachelor of Engineering in Information Technology, CGPA: 8.75/10

Hyderabad, India

April 2019

**Relevant Courses:** Data Structures and Algorithms, Object-Oriented Design, Operating Systems, Distributed Systems, RDMS

## TECHNICAL SKILLS

**Programming Languages:** Java, Python, C#, JavaScript/TypeScript, HTML/CSS3, SQL, NoSQL

**Web Development Frameworks:** Angular, React, .NET Core, Next.js, Django, Spring boot, GraphQL

**Cloud & Infrastructure:** AWS (EC2, RDS, Lambda, S3, ELB, SNS, SQS, EKS, API Gateway, CloudFront, CI/CD)

**Development & DevOps Tools:** Git, Unix, Docker, Kafka, Kubernetes, Jenkins

**Databases:** MongoDB, PostgreSQL, MySQL, MSSQL, DynamoDB

**Data & Analytics Tools:** Alteryx, Power BI, Tableau

## EXPERIENCE

### University of California

Graduate Student Researcher

Davis, CA

August 2023 – Present

- Developed and optimized Graph Neural Network (GNN) models for visualizing and analyzing EHR data, improving cancer survival prediction accuracy by 15%.
- Engineered AI-driven interpretability techniques for GNNs using graphlet frequencies and surrogate models, leading to a research paper submission at [ACM KDD 2025](#).

Lead Teaching Assistant

January 2023 – Present

- Guided 120 computer science students through Mobile Development (iOS and Android) and Software Development Life Cycle phases for Senior Project course. Fostered problem solving skills and managed system design, front-end and back-end code reviews.

Graduate Student Researcher

September 2022 – August 2023

- Orchestrated and developed an innovative end-to-end AI training pipeline to annotate the LexisNexis press release data using Python, Google Scripts, AWS Lambda, API-Gateway, and RDS PostgreSQL, slashing the annotation time by 30%.
- Researched a huge corpus of press release data to effectively process acquisition headlines using machine learning and large language models like GPT-4. Achieving an accuracy of up to 87% for business intelligence analysis.

### Deloitte

Software Engineer 2

Hyderabad, India

July 2019 – July 2022

- Designed backend microservices for migrating Tax R&C workflows from a legacy monolith to a cloud-native architecture for a top e-commerce client, enabling 20K+ workflows, 180K+ human tasks, and 25K+ machine tasks. Boosted customer satisfaction by 40% using Java, Spring Boot, DynamoDB, AWS EC2, ELB, Kinesis, S3, and CodePipeline.
- Created an advanced data analytics dashboarding tool for a prestigious fintech client by utilizing Python, Django, Alteryx, and TensorFlow, resulting in a 25% increase in quantitative accuracy for business value visibility.
- Developed a full stack permission and user data management web application for an internal SaaS tool for a highly reputable external client using Java, Spring Boot, Angular, Python, PostgreSQL, Docker, Kafka, Kubernetes and AWS, improving product management efficiency by 20%.
- Improved payment ease by 20% through the agile development of a cross-functional application with restful services for a tax payments and obligations application using React, .NET Core, C#, Docker, AWS.
- Reduced 1500 hours/year in data management for Contract Analysis and Extraction by Crafting a Named Entity Recognition AI Model (BiLSTM-CNN-CRF) in Python, and TensorFlow.
- Automated the Invoice Recognition System by customizing a Faster RCNN integrated with Tesseract OCR along with feedback training loop using Python, PyTorch and Jenkins reducing 800 hours/year in data management.

### Defence Research and Development Organisation

Research Intern

Hyderabad, India

June 2018 – August 2018

- Conducted system-level vulnerability assessments and penetration testing (VAPT) for Linux-based applications, enhancing the security protocols and identifying potential security gaps, which were reported to lead scientists.

### **Financial Analysis Automation using LLMs (AI-driven Market Data Processing)** | *Python, FastAPI, OpenAI, LLM*

- Designed data preprocessing pipelines to structure raw financial data streams and developed LLM-based entity extraction models for company tickers, sentiment analysis, and news impact predictions.

### **AI Answer Engine (Full-Stack AI-Powered Q&A Platform)** | *Next.js, TypeScript, LLM, RAG, OpenAI API*

- Developed an AI-powered full-stack Q&A platform using Next.js, TypeScript, and RAG to provide real-time contextual answers, optimizing query response time by 60%. Integrated OpenAI API and vector search pipelines, improving answer relevance by 40%.

### **CodeBase RAG (AI-Powered Code Retrieval)** | *Next.js, LLM, Pinecone, OpenAI, LangChain*

- Engineered a RAG-based code search engine using Pinecone and OpenAI embeddings, reducing developer code search time by 80%. Integrated LangChain-powered contextual search, optimizing AI-driven code retrieval.

### **Pentagram (Oil Painting style AI Image Generation)** | *Python, FastAPI, Modal, Diffusers, AWS, Stable Diffusion*

- Finetuned a cloud-based Stable Diffusion image generation modal using FastAPI, Modal, and Diffusers, enabling scalable oil painting style AI-powered image creation.

### **AI Code Assistant and Code Correction -Judge0** | *JavaScript, LLM, OpenRouter*

- Developed an LLM based code assistant and code correction for Judge0 open source IDE. Augment existing functionalities and allowing users to converse on the topic of the code written.

### **High-Performance Large-Scale Recommendation System Optimization** | *Python, PyTorch, CUDA, Docker*

- Spearheaded development of a high-performance prototype for large-scale machine learning recommendations, achieving 500ms training speedup and improved GPU utilization across diverse datasets via horizontal model slicing using heterogeneous memory, non-sparse index cache embedding, and multi-GPU parallelism.

### **AI Nutrition and Dietary Information** | *Python, BERT, InstructBlip, Git*

- Implemented a BERT model based InstructBlip system to predict food ingredients from images, resulting in a 3% enhancement in Intersection over Union (IoU) compared to state-of-the-art deep learning models.

### **VLM Evaluation Suite** | *Python, InstructBlip, Git*

- Finetuned InstructBLIP-FLAN-T5, InstructBLIP-Vicuna, CLIP, and custom ResNet encoder-attention LSTM decoder models with SPICE, CIDEr, and SPIDEr metrics to assess image captioning performance.