

## Kunal Babulal Bafna

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### PERSONAL PROFILE

Highly motivated MSc in Computer Science (Artificial Intelligence) graduate with three years of experience in software development projects. Skilled in Python and Julia for handling large datasets, containerization using Docker, orchestration with Kubernetes, and implementing CI/CD practices, with a strong background in Agile methodologies and collaborative problem-solving in dynamic environments.

### WORK EXPERIENCE

Associate Software Engineer, CodeArray Technology Pvt Ltd, India

August 2020 – August 2023

#### Cense Chatbot Web Application

- **Designed** scalable **backend RESTful API services** using Flask-Restful, capable of handling over **10,000 requests per minute** that enables the efficient management of chatbot conversation flows for clients.
- **Integrated** IT management tools (ServiceNow) and messaging frameworks (WhatsApp, Instagram) in chatbot portal, allowing businesses to reach over **5,000 customers per campaign** through automated message template designs.
- **Enhanced** the message intent detection **model's accuracy by 20%** with Keras and TensorFlow using **LSTM** that resulted in more accurate and effective responses for user queries.
- **Orchestrated** CI/CD pipelines using GitLab Workflow for faster product deployments and automation of workflows.
- Developed clear and detailed API documentation using **Swagger Hub**, outlining endpoints, request/response formats, and authentication methods.

#### Retailence Data Visualization Web Application

- **Containerized** the application to create containerised environments to manage efficient resources, consistent deployment, and scalability across different stages of new developments, testing, and production.
- Implemented a **machine learning-driven space optimization** module using unsupervised algorithms for retailers to optimize the space allocation for various product categories helped the retailers increase their **sales by 3%**.
- **Automated** the ETL process for nightly sales data loads, utilizing Celery with RabbitMQ, Python, Pandas, and Dask, ensuring efficient data processing from GCP, AWS, and Microsoft Azure to SQL databases.
- **Developed diverse web dashboards** using Vue.js that helped retailers get critical business information **across 300+ stores**, supporting strategic decision-making for customers.
- **Optimized** data handling by implementing Dask in the legacy codebase, enhancing processing efficiency by 40% for datasets exceeding 3 million rows.
- Cultivated excellent communication skills and built relationships with colleagues and product managers, by various communication channels for designing efficient reports to discuss requirements and present findings after analysing specific project requirements.
- **Configured** Nginx as a reverse proxy to efficiently manage load and increase the security and reliability of web application interactions.
- **Streamlined** database queries by 50% using Django ORM, enhancing application performance and efficiency.
- Deployed and hosted the backend application on Amazon EC2 using Kubernetes on AWS. Configured an Amazon S3 bucket for efficient storage and retrieval of data files.

#### Nexify Capital

- **Designed** a **background verification** checklist webpage for plaintiff case registration that helped funding companies conduct verifications before releasing funds for registered cases using .NET MVC framework.
- **Integrated third-party ALFA integration** within a web application to conduct background verifications for plaintiff receiving funds for their registered legal cases from other companies.
- **Optimized** complex data queries using **LINQ**, optimizing data retrieval processes and improving query performance by 20%.

### EDUCATION

MSc Computer Science (Artificial Intelligence), University of Nottingham, UK  
Expected Grade: Distinction

September 2023 – September 2024

Bachelor of Engineering in Information Technology, Grade: Distinction  
Shah And Anchor Kutchhi Engineering College, India

August 2016 – August 2020

## SKILLS

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**Technologies:** Python, Julia ,Pandas, NumPy, Docker, Machine Learning, Deep Learning, TensorFlow, Keras, PyTorch, C++, HTML5,Next.js, JavaScript, Ajax, jQuery, Tailwind CSS3, Bootstrap

**Data Visualization Tools:** Tableau, Power BI

**Database:** MySQL, MongoDB, PostgreSQL

**Frameworks:** Celery, Flask, Django, .NET MVC, Flask-Restful

**Other:** Microsoft Office Suite, Git, Apache Spark, Azure DataBricks, GitHub, Microservices, Data Structures, Nginx, Docker, Dask, Big Data, Apache PySpark, Time-Management, CI/CD Pipeline Development, Postman, Swagger, Nginx, Jupyter.

**Cloud Technologies:** GCP, AWS, Kubernetes, Google Cloud Storage, AWS S3.

**Operating System:** Linux, Windows.

## ACADEMIC PROJECTS

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### Smart Drying System using Machine Learning and Explainable AI for Accurate Moisture Content Prediction

- **Architected** advanced deep learning ensemble model with base models like LSTM, Artificial Neural network and Boosting algorithms, to accurately predict moisture content in the drying processes of bird's nests, achieving a 95% accuracy, a valuable ingredient in traditional Chinese medicine.

### Environmental Impact Analysis Dashboard for Dietary Habits

- **Created** an interactive Tableau dashboard to compare the environmental impacts of various dietary habits (vegan, vegetarian, fish-eaters, meat-eaters) in the UK, using advanced visualizations like Tree Maps and bar charts to analyse data across demographics.

### Fraud Detection System for Self-Checkout Centers

- Developed a supervised machine learning algorithm to detect fraud with accuracy of 90% in self-checkout stores where customers scan products for billing. It can also determine if the fraud was intentional or accidental.

### Fake News Classification using Apache Spark

- **Devised** a scalable machine learning solution using Apache Spark on Azure Databricks to classify fake news from RSS feeds. Implemented a real-time data ingestion pipeline with Apache Kafka on AWS EC2 instances to process RSS feeds continuously. Utilized Spark MLlib to train classification models and built a real-time prediction pipeline for timely fraud detection.

## PROFESSIONAL DEVELOPMENTS

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- Registered software copyright for a system titled 'Fraud Detection System for Self-Checkout Centers'.
- Published a research paper on "Fraud Detection System for Self-Checkout Centres" at the ICNTE 2021 conference.
- Completed Crash Course on Python by Google on Coursera.