

# Kushal Patel

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Highly analytical Data Scientist with proven expertise in Data Analysis, Data Visualisation, Machine Learning, Deep Learning, Digital Image Processing, Natural Language Processing, and Large Language Modeling.

## Education:

**Master of Business & Science, Artificial Intelligence & Analytics** **01/2024 - 12/2025 (Expected)**

Rutgers University, New Jersey, USA

**Master of Technology, Civil Engineering - CGPA: 9.11/10** **07/2017 - 05/2019**

Indian Institute of Technology, Madras (IITM), India

**Bachelor of Engineering, Civil Engineering - CGPA: 7.76/10** **06/2013 - 06/2017**

Vishwakarma Government Engineering College, Gujarat Technological University, India

## Experience:

**Data Science Engineer - Solution Analysts Pvt Ltd, India** **08/2019 - Present**

- Evaluated clients' needs and defined the scope of AI to address their business problems. Explored and researched new methodologies and technologies in the field of AI to fulfill client's requirements and enhanced the organization's capabilities. Mentored and guided aspiring junior data scientists to develop their technical skills.

### eNetra

- eNetra, an indigenous product by Solution Analysts, designed to assist individuals with visual disabilities by guiding them vocally using AI and IoT.
- Developed a real-time object detection system using the **YOLO** algorithm, used an HC-SR04 **ultrasonic sensor** for distance measurement with an accuracy of 98%, and implemented **Tesseract** OCR for image-to-text conversion. Integrated the Google **Text to Speech** API to convert text into speech.

### Indoor Positioning based on location fingerprinting using BLE-Beacon

- Trained a **weighted k-nearest neighbors (wkNN)** algorithm to determine the positions of beacons by analyzing their unique signal patterns captured by receivers. The model improved positional accuracy to up to 2.5-3 meters, a 50-55% enhancement compared to the traditional trilateration algorithm.
- Fed the Data from the **AWS Timestream** to this trained model, which was deployed on **AWS Lambda**. The predicted positions of the beacons by AWS Lambda were pushed to **AWS Location Services** and **AWS RDS**.

### Invoice Parser

- Developed an invoice parser by integrating cutting-edge technologies such as **image processing**, **Optical Character Recognition (OCR)**, and **Natural Language Processing (NLP)**. Used the **LayoutLM** model to automatically extract key parameters from scanned documents, achieving an F1-score of 80%, which has resulted in significant time and cost savings of approximately 90% and 70%, respectively.

### Omni Marketing Channel

- Developed Restful APIs to create dynamic and user-friendly chatbots that trigger targeted marketing campaigns to fixed audiences across different platforms, such as WhatsApp, email, and Facebook, based on customized flows and the sentiment of users' responses. To assess this, a **BERT** model was trained that accurately assesses the sentiment of people's responses with an F1-score of 90%. As a result, Omni Channel users experience an 8% increase in ROI while reducing their marketing expenses by 10%.

### Evaluation of Key Performance Indicators of employees

- Implemented a machine learning model to predict the productivity of over 250+ employees using advanced

data analysis methodologies and machine learning algorithms, including **Time Series Analysis with ARIMA (AutoRegressive Integrated Moving Average)** and **K-Means Clustering**. Built dashboards to visualize employee and organization KPIs, which saved a minimum of 200 hours of manual reporting work per week.

#### Data Science Intern - Solution Analysts Pvt Ltd, India

05/2019 - 07/2019

- Collaborated with different cross-functional teams to collect, clean, and preprocess image data from various sources in order to ensure data quality and usability.
- Developed an automated Know Your Customer (KYC) verification system using deep learning. A **FaceNet** model was trained to generate high-dimensional face encodings. Encodings were compared based on a threshold to accurately verify KYC, which resulted in a precision of 100% and an F1-score of 78%.

#### Graduate Teaching Assistant - Indian Institute of Technology, Madras (IITM), India

07/2018 - 05/2019

- Teaching Assistant for the *Experimental Techniques lab* at IIT Madras, effectively mentoring undergraduates.

#### M.Tech. Thesis

07/2018 - 05/2019

- **Title:** Non-linear behavior of diagrid structure in seismic regions
- **Objective:** To determine optimal structural configuration using pushover analysis and deep learning models.
- Used Latin Hypercube Sampling to create designs and performed pushover analysis on buildings with different heights, spanning across various seismic regions. Subsequently, trained an **Artificial Neural Network (ANN)** on this extensive dataset, yielding a remarkably high F1-score of 85% in precisely predicting the optimal structural configurations for buildings with varying heights in different seismic regions.

#### Courses:

**Data Science** for Engineers (*NPTEL*) | **Machine Learning** for Engineering and Science Applications (*NPTEL*) | **Machine Learning** - Introduction Nanodegree Program (*Udacity*) | **Deep Learning** Nanodegree Program (*Udacity*) | **Data Scientist** Nanodegree Program (*Udacity*) | **Programming** for Everybody (*Coursera*) | **Python Data Structures** (*Coursera*) | **Python** for Data Science, AI and Development (*Coursera*) | **Data Analysis** with Python (*Coursera*) | **Neural Networks** and **Deep Learning** (*Coursera*) | **Improving Deep Neural Networks:** Hyperparameter Tuning, Regularization and Optimization (*Coursera*) | **Convolutional Neural Networks** (*Coursera*) | **Sequence Models** (*Coursera*) | **Data Structures and Algorithms** (*Algoexpert*)

#### Skills:

- **Programming Language & Database Management:** Python | C | C++ | R | JavaScript | MySQL | PostgreSQL
- **Web Development Framework:** Django | FastAPI | Flask
- **Machine Learning & Deep Learning Libraries:** Scikit-learn | Pytorch | Tensorflow
- **Data Analysis & Visualisation Libraries:** Pandas | Numpy | Seaborn | Matplotlib | Tableau
- **Cloud Platforms:** AWS Lambda | AWS Timestream | AWS RDS | Amazon EventBridge
- **Expertise Areas:** Linear Regression | Logistic Regression | Decision Trees | Random Forest | SVM | KNN | Naive Bayes | K-Means Clustering | Hierarchical Clustering | PCA | Gradient Boosting | AdaBoosting | XGBoost | ANN | CNN | RNN | GAN | Image Processing | NLP | LLM | Data Structures and Algorithms

#### Awards:

- Received **gold-medal** in Data Science for Engineers NPTEL course.
- **Employee of the Year**, Solution Analysts Pvt Ltd (2022) - Awarded for outstanding performance.
- **Runner up** in "OPEN HOUSE'17" (*A State Level Project Competition*) held at VGEC, Gujarat.
- **Runner up** in "QUISTRUC'17" (*A State Level Quiz Competition*) held at CHARUSAT, Gujarat.

#### Volunteering & Extracurricular Engagement:

- Led fundraising drives, collected ₹20,000 in emergency funds, enabled the provision of food, medicine, and shelter for Kerala families impacted by devastating monsoon floods.
- Empowered underprivileged children in Madras slums with quality primary education as a dedicated volunteer at "Sahay", a reputed NGO.