

# NITISH KUMAR

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## OBJECTIVE

Aspiring for a creative and challenging work opportunity to enhance my technical skills, knowledge and explore the growth in your reputed organization.

## EDUCATION

- Indian Institute of Technology (BHU), Varanasi  
B.Tech in Mechanical Engineering

July 2014–June 2018

## SKILLS AND INTERESTS

**Languages:** Python, R, C++

**Technologies:** OOPS, Tensorflow, Git, MATLAB, Pandas, Numpy, Pytorch, OpenCV, Linux, GCP, ONNX, Streamlit, Langchain, AWS EC2, FastAPI, Retrieval augmented generation(RAG), Docker

**Courses:** Topics in Mathematics with Applications in Finance(MIT OCW)(**Derivative Pricing, VaR, Monte Carlo Simulation, Stress Testing, Volatility Modelling**), Stochastic Calculus, Introduction to Financial Engineering and risk management(Coursera), **Neural Networks** and Deep Learning(Coursera), Data Structure and Algorithms, Practical Deep Learning for Coders(Fast.ai), Data Analysis using **Pyspark**(Coursera), **Generative AI** with Large Language Models(Coursera)

## WORK EXPERIENCE

**Model Risk Quant at Acuity Knowledge Partners (formerly known as Moody's Analytics) from May 2023 to Current**

**Data Scientist at ABInbev from Jan 2022 to May 2023**

**Data Scientist at Karza Technologies from May 2020 to Jan 2022**

**Intern- Data Scientist at Karza Technologies from Jan 2020 to April 2020**

**Associate Consultant at Larsen & Toubro Infotech Ltd. (L&T Infotech) from Jul 2018 to Jan 2020**

## PROJECTS

### Model Validation

Acuity Knowledge Partners

May 2023–Current

- Validated credit risk and machine learning models around credit default, **stress testing** and **identity resolution** for one of the top 3 banks in Hawaii. Prepared model review documentation.
- Worked on validating multiple risk profile asset portfolios, based on **Modern Portfolio Theory**, for one of the top 10 US banks using univariate **Monte Carlo Simulation** based on forward looking **CMAs** along with **Latin Hypercube Sampling** and **Variance reduction** technique. Prepared model review documentation.

### TAX Analytics

AB InBev

Jan 2022–May 2023

- Transform the existing manual process by codifying business rules and metrics to automate it which saved \$4M in Taxes.
- Used Azure devops to prepare the repository and make deployable and scalable solution.
- Further developed **PowerBI** dashboard based on weekly data refresh and encompassing 5 geographies on top of the solution.

### FX hedging using deep learning

AB InBev

Jun 2022–Sept 2022

- Provided a solution for making the decision of which derivative to use for hedging **USD/BRL currency pair** against the raw material price fluctuations over year.
- Used tabular learning to choose between **Options and Futures** over weekly period based on market and macroeconomic variables.

### NLP Projects

Self

May 2022–Current

- Created a **chatgpt** chatbot based on **GPT4** to work as AI tutor. I used **pinecone** vector database to store the indexed documents. Used langchain to efficiently implement it as a **streamlit** app.
- Made an streamlit app on top of OpenAI **GPT3** to extract transcript from any Youtube video and summarize in 10 points using **prompt engineering**.
- Developed a streamlit app based on transformer based sentiment analysis model and deployed on **AWS EC2** using **Docker**. [Sentiment Analysis Streamlit app with Transformers using Docker on AWS EC2 ...](#)
- Developed a **Llama2 RAG** based chatbot which uses **retrieval augmented generation (RAG)** using any webpage with support for chat history in **Langchain**. Further served it as RESTapi using **FastAPI**.

#### Face Matching Algorithm Implementation

Karza Technologies

Jan2020-Jan 2022

- Implemented an algorithm for **few-shot** learning of faces for better metric learning, based on **Resnet100** architecture and cosine based loss.
- Reduced the training time by **half** by careful LR reduction technique and converging to **state of art** on **GCP VM** instance.
- Also developed the logic for **reviewNeeded** tag , to bring in human intervention in 5% cases in which quality of image is too poor to be processed.
- Further extended the evaluation dataset based on various factors that might effect the quality of match.
- Developed the whole codebase for deployment on AWS lambda and made **low latency api servable** solution.

#### Face Detection Implementation

Karza Technologies

May2020-April2021

- Implemented **retinaface** face detection based on wider face dataset and developed whole codebase for AWS lambda based **low latency api servable** solution.
- Further made the model robust towards **rotated faces**, which isn't tackled on the open source solutions.
- Retrained the model for small faces with poor quality in KYC domain images and removal of holographic face.

#### APTOS 2019 Blindness Detection by Kaggle

- Created a model based on **Efficientnet-B4** architecture to find the severity of diabetic retinopathy and scored in top 9%(i.e. 248/2943) on private leaderboard.
- Preprocessed and cropped the eye images using **OpenCV** to reduce black area in image with the help of threshold,countour and minencosingcircle.
- As the training data was very less ,used pretrained model on imagenet, pretrained to Diabetic Retinopathy 2015 data and APTOS 2019 to finetune for current use case.
- I treated this problem as regression problem, and used metric MSE and Kappa score. I predicted by thresholding the real value with optimized threshold.
- Also implemented Test time augmentation to improve generalization.

#### Jigsaw Unintended Bias in Toxicity classification by Kaggle

- Created an ensemble of transformer based (**BERT**) models for toxicity classification and reducing unintended bias and it scored in top 10% in public leaderboard(i.e. 309/3167).
- Implemented multi-task learning to improve generalization.
- Implemented transfer learning on top of BERT-base with help of pytorch.
- Implemented a custom made loss function i.e. a modified binary crossentropy loss
- Implemented a custom dataloader to reduce training time.
- Implemented various strategies for Learning rate reduction like mimicking single 2 epoch run by two 1 epoch run and learning rate annealing.

#### ACHIEVEMENTS

- Got **bronze** medal in APTOS 2019 held by Kaggle.
- Won Ranked **9th** on leaderboard on HDFC Bank Machine Learning Hiring Challenge out of 6661.
- Won **2nd** prize in Analiticity , TECHNEX'17.
- **108th** Position, Jharkhand Combined Entrance Competitive Examination -2014.

#### EXTRA CO-CURRICULARS

- **Event Head** in COMET 17, held by Mechanical Engineering Society (MES) IIT (BHU), Varanasi.
- **Panel member** of Aero Modelling Club, IIT (BHU), Varanasi and organised workshops for the same.
- **Co-coordinator** of D'Aeroglisseur, TECHNEX-2016, the annual techno- management fest of IIT (BHU), Varanasi.