

Shubham Vashishth

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[in shubhamvashishth](https://www.linkedin.com/in/shubhamvashishth) | [shubhamvashishth](https://github.com/shubhamvashishth) | [Portfolio](#)

EDUCATION

University of Stuttgart

MS Computer Science(Autonomous Systems)

Stuttgart, Germany

October 2024 - Present

Greater Noida Institute of Technology(aff.GGSIPU)

B.Tech in Computer Science Engineering

Cumulative GPA: 8.52/10.0

Greater Noida, India

Aug 2019 - July 2023

SKILLS

Scripting Languages : Python | C++

Libraries & Frameworks : Tensorflow | Pytorch | Scikit-learn | Keras | NumPy | Pandas | OpenCV

Model Deployment : Flask | FastAPI | Docker

Tools & Technologies : Git | LLM | RAG | Langchain | AWS | GCP | AZURE | VS Code | Jupyter

WORK EXPERIENCE

RIPIK.AI

Machine Learning Engineer

Noida, India

April 2024 – Aug 2024

- **Improved** the design and development of **Optimus**, a sophisticated production planner tool tailored for the pharmaceutical industry, leveraging linear optimization algorithms for optimal scheduling.
- Developed and implemented **meta-heuristic** algorithms, specifically designed to accommodate the **constraints** and **requirements** of plant production teams.
- Used **LLMs** to generate comprehensive monthly reports, providing clear data visualizations and analytics for easy interpretation and decision-making
- **Engineered** a compliance tracking system to compare actual plant performance against schedules, enabling performance analysis, deviation identification, and ongoing process optimization.
- **Trained and supported** end-users in production facilities to ensure smooth adoption of the tool and maximized its impact on operational workflows.

CONSTEMS-AI

Associate AI Software Developer

Noida(Remote), India

April 2023 – April 2024

- **Contributed** to the development of an AI-based model for real-time vehicle data analysis, successfully **deployed** on Indian roads in collaboration with the National Highways Authority of India (**NHAI**).
- Led the **conceptualization**, design, and execution of a pipeline for detecting wrong-way vehicles, leveraging optical flow technology to improve traffic safety and reporting accuracy.
- **Implemented** machine learning models for predicting **traffic bottlenecks** and adaptive traffic signal control algorithms based on **reinforcement learning** techniques, resulting in a 15% reduction in overall travel time.
- Developed a robust **product recognition system** for unstructured store layouts, improving accuracy in identifying and pricing products by 25% and reducing instances of mislabeling.
- **Engineered a state-of-the-art product identification model** that demonstrated a 97% accuracy in discerning diverse brands and their respective variants, showcasing a keen eye for detail.
- **Mentored junior interns**, providing training on standard operating procedures to enhance their integration into workflows and ensure project efficiency.

- Developed an automated trading system using Python and AlphaTrade API for data analysis and execution of trades, implemented algorithms to **optimize** trade execution which was **faster by 47% than previous versions**.
- Build an **Object Detection model** using YOLOV5 to detect various features of local kirana/medical shops like assets, products, machinery etc.
- Built and maintained data pipelines using **AWS Data pipeline** and managed **data lake architecture** on S3 for data storage and retrieval.

PROJECTS

DASH CAM NUMBER PLATE AND FACIAL RECOGNITION FOR ONCOMING TRAFFIC ([Bachelor's project](#))

- **Implemented** custom deep neural networks, **fine-tuning** hyperparameters and **optimizing** layer architectures. Utilized **TensorFlow** for efficient model training and deployment, incorporating **transfer learning** with pre-trained models to expedite convergence. Employed **GPU acceleration** to significantly enhance computational efficiency during the training phase.
- Deployed **CNNs** with multiple convolutional and pooling layers for real-time object detection. Utilized frameworks like **PyTorch** to implement region-based CNNs (R-CNNs), optimizing anchor box configurations for precise localization. Integrated **non-maximum suppression** techniques to refine detection outputs and eliminate redundant bounding boxes.
- **Engineered** OCR algorithms using recurrent neural networks (RNNs) for sequence modeling. **Implemented** bidirectional LSTMs to capture contextual information and boost character recognition accuracy. Employed **transfer learning** from pre-trained language models, such as **Tesseract**, **fine-tuning** for specialized license plate character recognition.
- Implemented **Siamese networks** for facial feature extraction, incorporating **contrastive loss** functions for discriminative embeddings. Introduced **triplet loss** functions to enforce a margin between positive and negative pairs, enhancing the system's ability to distinguish between individuals. Model parameters were **fine-tuned** using advanced techniques, including **gradient clipping** for stable convergence.

BLUR DETECTION USING CNN

- Developed a robust Convolutional Neural Network (**CNN**) model to detect and quantify image blur, achieving accurate predictions based on **Laplacian map variance**. Trained on diverse datasets (**Undistorted, Artificially Blurred, Naturally Blurred**) for comprehensive image quality assessment.
- Serialized training data and model for reproducibility, **deployment** and seamless **integration** into deployment pipelines., designed and trained a multi-layered CNN **architecture** for feature extraction and blur prediction.
- Established **normalization** and **denormalization** processes to enhance model **convergence** during training and facilitate meaningful interpretation of **predictions**., resulted in a high accuracy score of **95%**, indicating the model's proficiency in predicting image blur.

STOCK PRICE ANALYSIS AND PREDICTION USING LSTM

- Developed a sophisticated **predictive model** utilizing LSTM neural network architecture to conduct a **comprehensive analysis** of Google's stock prices and make informed predictions.
- Utilized the widely-used **yfinance** library in Python to download historical **stock** price data for Google, allowing for a thorough examination of trends and patterns.
- Employed advanced data preprocessing techniques such as **scaling** and **windowing** to optimize the data for input into the LSTM model.
- Produced visually appealing and informative charts using **data visualization** tools such as Matplotlib, providing investors with **valuable** insights into both historical and predicted stock prices.

CERTIFICATIONS

1. Baseline: Data, ML, AI
2. Perform Foundational Data, ML, and AI Tasks in Google Cloud
3. Kubernetes in Google Cloud
4. Google Cloud Computing Foundations: Data, ML, and AI in Google Cloud

