Kshitij Singh

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EDUCATION

Dayananda Sagar College of Engineering   Bengaluru, Karnataka
Bachelor of Engineering in Computer Science and Engineering (Data Science)   *2023 – 2027*

Air Force School   Bengaluru, Karnataka
XII (CBSE - 93%)   *2023*

PROJECTS

Visual Language Translation & Typesetting Engine | *Python, PyTorch, OpenCV, PaddleOCR, LaMa*   GitHub
- Engineered end-to-end CV+NLP pipeline automating manga translation through 4-stage architecture: text detection (YOLOv5), OCR extraction (PaddleOCR - 94% CER), inpainting (LaMa model), and context-aware translation, reducing manual effort by 85%
- Optimized text detection achieving 0.92 F1-score on custom manga dataset through transfer learning and post-processing filters; integrated multiple translation backends (Google Translate API, DeepL) with quality scoring to select optimal output
- Implemented smart inpainting with LaMa deep learning model achieving 28.5 dB PSNR for background reconstruction, preserving art style integrity while enabling clean text replacement
- Deployed production-ready system with FastAPI backend, batch processing for 50+ page volumes, and comprehensive evaluation framework measuring detection IoU, OCR accuracy, and translation BLEU scores

Customer Intelligence System: CLV & Churn Prediction | *Python, LightGBM, XGBoost, SHAP, Streamlit*GitHub
- Engineered end-to-end customer intelligence platform combining CLV regression (LightGBM, R^2=0.87) and churn classification (XGBoost, AUC=0.92) on 500K+ transactions, with 32 behavioral features spanning RFM metrics, purchase patterns, and temporal trends
- Designed strategic 2×2 segmentation matrix mapping customers across value and risk dimensions, identifying $45K+ at-risk revenue and enabling targeted interventions with 114% ROI through personalized retention strategies
- Implemented SHAP-based model interpretability revealing recency (34% churn impact) and monetary value (42% CLV impact) as key drivers, with feature importance analysis guiding business decision-making
- Deployed production-ready Streamlit application with batch predictions, interactive visualizations, automated segment recommendations, and CSV export functionality processing 10K+ customers in ¡3 seconds

Full-Stack Ecommerce Platform with ML Recommendations | *Node.js, Express, PostgreSQL, React*   GitHub
- Developed full-stack ecommerce application with Node.js, Express, PostgreSQL, and Prisma ORM, implementing secure REST APIs for authentication, product management, cart operations, and order processing
- Built robust backend with JWT authentication, role-based authorization, product CRUD, dynamic cart updates, stock validation, and order lifecycle handling
- Integrated React frontend with backend APIs featuring product catalog, detail pages, cart UI, and admin dashboard with image upload via Multer; designed scalable architecture using modular controllers and Prisma migrations

CNN-Based Digit Recognition System | *Python, TensorFlow/Keras, Streamlit*   GitHub
- Architected 6-layer CNN achieving 99.5% accuracy on MNIST through systematic experimentation with batch normalization, dropout regularization (p=0.5), and Adam optimizer, outperforming baseline MLP by 12%
- Built interactive Streamlit web application with drawable canvas interface, displaying real-time predictions with confidence scores and class probability visualizations using cached model for instant inference
- Engineered preprocessing pipeline normalizing user input (grayscale conversion, bounding box detection, center-of-mass alignment, 28×28 resizing) ensuring consistency with training data distribution

TECHNICAL SKILLS

Languages: Python, C++, JavaScript, SQL, R
Machine Learning: TensorFlow, Keras, PyTorch, scikit-learn, XGBoost, LightGBM, SHAP, Optuna
Deep Learning: CNNs, Transfer Learning, Model Optimization, Computer Vision, NLP
Data Science: Pandas, NumPy, Matplotlib, Seaborn, Feature Engineering, A/B Testing
MLOps & Deployment: Streamlit, FastAPI, Docker, Model Versioning, REST APIs
Frameworks & Tools: React, Node.js, Express, Git, Linux, AWS
Databases: PostgreSQL, MongoDB, MySQL