NILESH PRABHUJI KOWE

Pimpri, Maharashtra, India. 411018 | nileshkowe27@gmail.com | +91-9325375887
LinkedIn: https://www.linkedin.com/in/nilesh-kowe-618735204/
GitHub: https://github.com/nileshkowe
Portfolio: https://nileshdev.shop/

EDUCATION

Savitribai Phule Pune University, D.Y. Patil College of Engineering
Pune, Maharashtra
B.E. - Computer Engineering, July 2024
CGPA: 8.32 / 10.00

SKILLS

- **Machine Learning & Computer Vision:** YOLO (v5/v8/v11), Object Detection, Image Segmentation, OCR (PaddleOCR, Tesseract), PyTorch, Transfer Learning, Data Augmentation, Model Optimization
- **Programming:** Python, JavaScript, SQL, Embedded Systems Integration
- **Frameworks & Libraries:** FastAPI, Flask, React.js, Node.js, Express.js, OpenCV, PIL, scikit-learn
- **DevOps & Deployment**: Docker, Containerization, Cloud Deployment, REST API Development, GPU Optimization, CI/CD
- **Automation & Integration:** n8n, Workflow Orchestration, API Integration, Webhooks, Real-Time Data Processing
- **Tools & Platforms**: Git, Linux, CUDA, Streamlit, Jupyter, Google Sheets API, Gmail API
- **Databases**: SQLite, PostgreSQL, MongoDB

PROFESSIONAL EXPERIENCE

Computer Vision Engineer, Full-Time
Pixonate Technologies
September 2024 - Present | Pune, Maharashtra

- Architected and deployed production-grade medical imaging analysis platform for Tata Memorial Hospital, processing 250+ whole slide images (WSIs) daily for cancer research and pathology workflows
- Engineered OCR pipeline for pharmaceutical packaging quality control achieving 97% accuracy using YOLOv8 object detection combined with PaddleOCR, reducing manual inspection time by 70%
- Built real-time CCTV surveillance system with face detection and violation tracking capabilities, implementing RTSP streaming integration and WebSocket-based frontend synchronization
- Developed full-stack inference pipeline integrating React frontend, Node.js gateway, and Python FastAPI backend with Docker containerization for seamless deployment
- Implemented automated data processing workflows using n8n orchestration, connecting Docker containers, ML models, Google Sheets, and external APIs for end-to-end automation
- Created PCB inspection system deployed at manufacturing facility (Kyoritsu), including on-site camera mounting, lighting configuration, and real-time inference pipeline setup

Machine Learning Development Intern, Internship
Pixonate Technologies
March 2024 - September 2024 | Pune, Maharashtra

- Designed and implemented histology image analysis tools for oral cytology and tissue microarray applications used by medical professionals at research institutions
- Built i-AMRIT digital pathology platform enabling medical image visualization, annotation, and collaborative analysis for healthcare research teams
- Developed whole slide image (WSI) processing pipeline handling MRXS to SVS conversion using VIPS/pyvips for efficient large-scale medical image management
- Conducted comprehensive OCR technology evaluation comparing GPT-4 Vision, PaddleOCR, Tesseract, and Parseq for optimal text extraction accuracy in medical contexts

PROJECTS

Medical Packaging OCR System (Production Deployment)
YOLOv8 | PaddleOCR | FastAPI | Docker | GPU Optimization | Real-Time Processing

- Designed end-to-end computer vision pipeline for pharmaceutical quality control automation, detecting and extracting text from medicine boxes, bottles, and labels
- Trained custom YOLOv8 model with 11 object classes (labels, barcodes, expiry dates, batch numbers) achieving 97% detection accuracy through data augmentation and transfer learning
- Implemented ROI-based OCR extraction pipeline with GPU acceleration processing 1000+ images daily in production environment
- Built FastAPI backend with Streamlit interface for real-time inference and structured JSON output for downstream validation systems

Clinic Management Web Application (Live Production System)
React.js | Node.js | FastAPI | n8n | REST APIs | Cloud Deployment

- Developed full-stack web application for healthcare clinic management with appointment booking, patient records, and automated communication workflows
- Implemented responsive React frontend with Tailwind CSS ensuring mobile compatibility and intuitive user experience
- Built Node.js backend with RESTful API architecture for secure patient data management and form processing
- Integrated n8n automation workflows for email notifications, appointment confirmations, and contact form submissions
- Deployed production system on Hostinger with custom domain and SSL certificate, serving 100+ patients monthly
- Live deployment: https://dhanvantariclinic.org

Whole Slide Image Analysis Platform (Healthcare Research)
PyTorch | OpenCV | QuPath Integration | GeoJSON Processing | Database Management

- Architected tissue microarray (TMA) histology image analysis application for Tata Memorial Hospital enabling keypoint detection and automated histology analysis
- Developed WSI patch extraction pipeline managing QuPath annotations, creating square ROIs, and merging annotation data in GeoJSON format
- Built cytology data analysis system processing 300+ conjunctive images with automated patch extraction and annotation validation
- Implemented Python Flask backend with PyTorch-based deep neural networks for image classification and SQLite storage for annotation management

DGA Detection System (Cybersecurity Application)
Transformer Models (GPT, BERT, BLOOM) | NLP | Entropy Analysis | LSTM Comparison

- Developed Domain Generation Algorithm detection system using transformer-based tokenization to identify malicious domain names
- Implemented entropy calculation and token length analysis reducing false negatives from traditional LSTM-based detection models
- Compared multiple language models (GPT, BERT, BLOOM) for optimal malicious domain classification accuracy

Industrial Defect Detection System (Manufacturing QC)
UNet Segmentation | YOLO Object Detection | Industrial Camera Integration | Edge Deployment

- Built flywheel fault detection system using UNet segmentation and YOLO for identifying cracks, holes, chamfers, and axel rings
- Integrated industrial camera inputs with real-time inference pipeline for manufacturing quality control

Automated Document Processing Workflow (Production System)
n8n | Multiple OCR Engines | AI-Driven Structuring | Ollama | Google Sheets Integration

- Created end-to-end document OCR workflow comparing GPT-4, PaddleOCR, and Parseq for optimal text extraction results
- Implemented AI-driven data structuring using Ollama local models (Gemma 3.4b, DeepSeek 1.5b) for automated validation
- Built parallel processing pipeline routing PNG and JSON files separately with binary format conversion for efficient n8n handling
- Integrated automated saving of structured outputs to Google Sheets with complete end-to-end validation workflow

RESEARCH & PUBLICATIONS

A Cytology Dataset for Early Oral Squamous Cell Carcinoma Detection Preprint, 2025

- Contributed to the development of the first multicentre oral cytology dataset comprising expert-annotated PAP and MGG stained slides from ten medical centres in India
- Implemented AI-driven diagnostic methods for cellular anomaly classification to reduce inter-observer variability and improve early detection in resource-constrained settings
- Preprint available at: arXiv:2506.09661

LEADERSHIP & VOLUNTEER EXPERIENCE

AutoOps Agency, Founder
December 2024 - Present | Remote

- Founded automation and web development agency providing AI-powered solutions for small businesses and healthcare providers
- Delivered production web application for medical clinic with integrated n8n automation workflows
- Managing client communications, requirements gathering, full-stack development, and cloud deployment operations

TECHNICAL ACHIEVEMENTS

- Promoted from ML/AI Intern to Senior AI Engineer within 10 months based on consistent delivery and technical excellence
- Delivered production ML system to India's premier cancer research institution (Tata Memorial Hospital) within first 6 months of professional experience
- Built and deployed 15+ production-ready computer vision and full-stack applications across healthcare, manufacturing, and cybersecurity domains
- Self-taught ML engineer with hands-on expertise in YOLO, PyTorch, and production deployment through real-world project implementation