Bishwajit Prasad Singh AI/ML Engineer | Computer Vision & Medical AI | Deep Learning | Azure Cloud

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Professional Summary

AI/ML Engineer specializing in Medical Computer Vision and Deep Learning, with demonstrated expertise in building production-ready segmentation and landmark detection systems. Proven ability to design end-to-end ML pipelines—from data curation and model optimization to deployment-ready workflows. Strong foundation in PyTorch, CNNs, U-Net architectures, and MLOps automation. Experienced in delivering scalable solutions with Azure Cloud and high-performance APIs. Ranked Top 15 nationally in a predictive modeling competition.

Key Achievement

- Ranked Top 15 (Rank 14) in MachineHack Taxi Trip Time Prediction Challenge
- Delivered 99.9% uptime API architecture and 40% automation efficiency gains for enterprise analytics clients

Technical Skills

- **AI / ML & Deep Learning: Deep Learning Frameworks:** PyTorch, TensorFlow, Keras**, Computer Vision:** CNNs, U-Net, ResNet, Attention Mechanisms (CBAM), Transfer Learning, **Medical Imaging:** Image Segmentation, Landmark Detection, Medical Image Analysis, **Model Optimization:** Custom Loss Functions (Focal+Dice, Adaptive Wing), Mixed Precision Training**, Hyperparameter Tuning, Classical ML:** XGBoost, CatBoost, LightGBM, Feature Engineering, Cross-Validation
- **MLOps & Deployment: - Cloud Platforms**: Azure (Databricks, Data Factory, Data Lake, ML Studio), **Containerization & CI/CD**: Docker, GitHub Actions, Azure DevOps, **ML Workflow**: Experiment Tracking (MLflow), Model Monitoring, Data Versioning, **API Development**: Flask, FastAPI, REST APIs (99.9% uptime production experience)
- **GenAI & NLP: Large Language Models**: OpenAI API, Hugging Face Transformers, Prompt Engineering, **RAG Systems**: Vector Databases (FAISS, ChromaDB), LangChain, Retrieval Strategies, **NLP Techniques**: BERT, Word2Vec, TF-IDF, Semantic Similarity
- **Programming & Data: Languages**: Python, SQL, Java, **Libraries**: NumPy, Pandas, Scikit-Learn, OpenCV, Albumentations **Databases**: MySQL, Snowflake (Foundational), **Version Control**: Git, GitHub

Work Experience:

Backend Developer, Cygnus Advertising | Kolkata | Apr 2024 – Oct 2024

- Automated analytics pipelines using **Python & SQL**, reducing manual reporting effort by 40%.
- Designed and deployed **high-concurrency REST APIs** with **99.9% uptime**, supporting real-time KPI dashboards
- Optimized **SQL queries and indexing**, achieving **30% lower query latency** on core datasets.

Independent AI Research & Development | Mar 2025 – Present

- Developing production-grade medical AI systems with a focus on computer vision, model optimization, and MLOps automation
- Actively collaborating with clinicians / domain datasets for applied medical imaging use cases

Technical Mentor(Java & Python Full Stack) | SVU, Techno India | Nov 2024 – Feb 2025:

- Mentored 50+ final-year engineering students on industry-standard development practices, focusing on clean code, version control, and deployment workflows

Education: - B.Tech in Computer Science Engineering – NSHM Knowledge Campus, Durgapur, WB, 2019-2023 | CGPA: 8.71

Certifications | Github: Microsoft Certified: Azure Fundamentals | Data Fundamentals

Key AI & Data Projects

Fetal Ultrasound Biometry – Deep Learning System | Jan 2026 | Github
Medical AI Research |

PyTorch, U-Net, ResNet34-UNet, CBAM, Data Augmentation:

- Built end-to-end fetal landmark detection & segmentation pipeline achieving Dice 0.9575 and ~6px median localization error (60% cases <10px)
- Conducted hypothesis-driven experiments (U-Net → Augmented U-Net → ResNet-UNet+Attention), demonstrating data quality > model complexity
- Engineered custom loss functions (Focal+Dice, Adaptive Wing), mixed-precision training, and reproducible pipelines for deployment readiness

MachineHack Taxi Trip Time Prediction (Top 15-Github) |
XGBoost, CatBoost, Feature Engineering, Model Optimization:

• Achieved Rank 14 on the global leaderboard by engineering complex temporal and geospatial features to predict taxi trip duration.
• Implemented an ensemble model using XGBoost and CatBoost, optimizing hyperparameters via GridSearch to minimize RMSE.
Current Status: Dockerizing the inference pipeline for real-time deployment.

AI Resume Matcher Suite | Github
Python, Streamlit, SpaCy, TF-IDF, Cosine Similarity, Azure Databricks:

- Developed a semantic resume–job matching system with 90%+ accuracy.
- Automated data preprocessing, vector similarity scoring, and GenAI-powered recommendations.
- Deployed in Azure Databricks with CI/CD pipelines, and built monitoring alerts for model drift.