Anubrata Bhowmick

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Summary

A motivated Group Leader in AI and Data Analytics at Olympus EMEA, I specialize in developing advanced healthcare technologies through Deep Learning, Graph Neural Networks, and Large Language Models. Leading a cross-functional team, I drive the strategic integration of AI into medical products, including developing scalable MLOps platforms that improve data processing efficiency by 30%. With expertise in managing end-to-end machine learning pipelines and cloud-based solutions on Azure, I leverage Generative AI to enhance diagnostic accuracy and optimize real-time medical interventions. My strong programming skills, showcased by participation in the ACM-ICPC Northwest European Regionals, enable me to deliver innovative, impactful solutions that advance Olympus' position in medical technology.

Experience

Quest Medical Imaging(Olympus EMEA) **Apr 2024 – Present**
Group Leader: Data Analytics and AI *Wieringerwerf, Netherlands*

- Leading a cross-functional team of research scientists and software engineers in developing cutting-edge AI-driven solutions that not only deliver impactful use cases for Olympus EMEA and Tokyo but also position Olympus at the forefront of innovation, driving the future of medical technology and imaging.
- Leading the strategic integration of AI-driven technologies into healthcare products, including Generative AI models, overseeing the full project lifecycle from roadmap creation to stakeholder engagement, ensuring alignment with organizational goals and timelines.
- Leading the development of a scalable MLOps platform, streamlining the data analysis pipeline and improving data processing efficiency by 30%, enabling the direct reception and analysis of spectral imaging data for faster and more accurate diagnostics.
- Utilizing Generative AI models to simulate diagnostic outcomes, optimizing real-time medical interventions, and enhancing clinical decision-making with predictive analytics for improved patient outcomes.
- Leading the Design and implementation a robust data pipeline that integrates with AI models to support real-time spectral imaging diagnostics, reducing response times for medical professionals and improving the accuracy of AI-driven diagnoses.
- Leading cross-functional teams in delivering AI-driven healthcare innovations, ensuring the successful deployment of cutting-edge solutions by aligning technical teams and stakeholders with a focus on scalability, efficiency, and real-time performance.

Quest Medical Imaging(Olympus EMEA) **Mar 2023 – Mar 2024**
Research Scientist *Wieringerwerf, Netherlands*

- Developed a RAG-driven clinical decision support system that integrates hyperspectral imaging with real-time retrieval of medical knowledge, enabling surgeons to make data-augmented decisions during operations and improving tissue classification accuracy by 20%.
- Developed and optimized deep learning models using CNNs and GANs for synthetic data generation, significantly enhancing data augmentation strategies, resulting in a 95% detection accuracy for parathyroid gland detection during intraoperative procedures.
- Implemented Generative AI techniques to create synthetic hyperspectral images for training machine learning models, improving the classification accuracy of fat and nerve tissues by 20%, driving advancements in surgical precision.
- Conducted extensive validation studies utilizing both clinical datasets and AI-generated synthetic data, leading to a 25% performance improvement in algorithms under real-world surgical conditions, ensuring reliable outcomes.
- Collaborated closely with medical professionals to refine AI-driven simulations, validating and fine-tuning detection and classification algorithms, reducing false positive rates by 10% and increasing the reliability of AI in clinical environments.
- Enhanced data-driven decision-making by incorporating AI-generated synthetic datasets, leading to more accurate model training and improving the robustness of machine learning systems used in high-stakes medical applications.

Philips **Sept 2021 – Feb 2023**
Data Scientist *Eindhoven, Netherlands*

- Led the development of an advanced hospital analytics tool using Generative AI models for scenario-based simulations of hospital traffic, improving operational efficiency by 20% and reducing costs.
- Designed and deployed GAN-based synthetic audio data generation for training deep learning models, increasing cry and breathing detection accuracy by 25% in a real-time nursery monitoring environment.

- Integrated NLP and Generative AI to develop a real-time infant monitoring system, utilizing text-to-speech models to simulate alerts for potential abnormalities, enhancing system reliability and detection accuracy.
- Optimized deep learning models for edge devices, applying Generative AI-based image enhancement techniques that reduced latency by 30% and memory usage by 40%, improving overall performance in resource-constrained environments.

- Validated and tested an ensemble of AI models, incorporating generative models for scenario planning, resulting in a 15% improvement in system reliability and robustness under real-world conditions.

Tata Consultancy Services **Aug 2016 – Feb 2019**

Systems Engineer *Kolkata, India*

- Developed a behavioral classification algorithm to identify and blacklist customers based on fraudulent patterns, boosting TCS BaNCS' retention rate to 90% and preventing millions of fraudulent transactions. This solution enhanced the platform's security and strengthened its market standing.
- Led multiple data-driven product development projects, contributing to a 60% growth in TCS BaNCS. Key achievements include implementing a customer blacklisting system, developing a scalable payment platform, and launching a new insurance product pipeline.
- Collaborated with cross-functional teams, including engineers, product managers, and stakeholders, to deliver machine learning-powered solutions that enhanced the platform's capabilities and expanded its market reach.

Education

University of Twente **Sep. 2019 – July 2021**

Master of Science in Computer Science *Enschede, Netherlands*

Bengal Institute of Technology **Aug. 2012 – July 2016**

Bachelor of Technology in Information Technology *Kolkata, India*

Publications and Patents

Patents **2022 - Present**

- 2 patents approved at Philips, 3 patents approved at Quest Medical Imaging, and 2 patent pending.

Baby Positioning using Quantization Aware Training for Edge Devices **September, 2022**

- Developed a Quantization Aware Training (QAT) method for deploying deep learning models on edge devices, optimizing real-time infant monitoring for resource-constrained environments. The approach enables efficient machine learning inference on low-power devices while maintaining high accuracy in infant positioning detection.

Markers of Brain Resilience **January 2021**

- Developed innovative ML-based techniques to enhance functional brain connectivity estimation using MRI data, addressing the gap in resilience research post-trauma. The study leverages preprocessing pipelines, feature engineering, and Multi-Layer Perceptron (MLP) models to identify robust biomarkers of brain resilience. Comparative analysis revealed that feature-engineered MLP models outperform data-intensive graph models, showcasing the efficacy of low-data-dependent ML approaches in neuroscience.
- Click Here: Master Thesis, UTwente

Augmenting context-aware citationrecommendations with citation and co-authorship history **July 2020**

- Proposed a novel recommendation model integrating context-aware machine learning, citation history, and co-authorship details, enhancing citation recommendations in academic research. By incorporating domain-specific embeddings and Natural Language Processing (NLP) techniques, the study demonstrated that co-authorship information significantly boosts recommendation accuracy, outperforming traditional context-based models.
- Click Here: 18th International Conference on Scientometrics and Informetrics, ISSI 2021

Technical Skills

Programming Languages: Python, Go, SQL
Machine Learning & AI Tools: TensorFlow, PyTorch, Scikit-learn, Keras, OpenCV, Hugging Face, Generative Adversarial Networks(GANs), Convolutional Neural Networks(CNNs), Natural Language Processing(NLP),Large Language Models, Retrieval Augmented Generations(RAGs), Agents
Developer Tools: Azure, Git, Docker, Kubernetes, Airflow, DVC, Hydra, MLFlow, FastAPI
Technologies/Frameworks: Linux, DICOM, Azure Machine Learning, Kubernetes, MLOps Pipelines
Leadership Experience:Spearheading AI and Generative AI-driven product development, overseeing cross-functional teams, managing end-to-end ML project lifecycles, roadmap creation, and stakeholder management.