

Faraz Shamim

Medical Student | Machine Learning Enthusiast

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Profile

Dedicated medical student with a strong passion for innovation at the intersection of healthcare and technology. Enthusiastic about leveraging machine learning and data science to advance medical research and improve patient care. Experienced in collaborative environments, with a proactive approach to problem-solving and continuous learning. Skilled in programming languages like Python, SQL, and AI frameworks, with hands-on experience in developing predictive models and integrating advanced technologies into practical solutions.

Selected Projects

Lumbar Spine MRI Degenerative Classification Web Application

- Developed a deep learning model using PyTorch and the TIMM library to diagnose and classify the severity of lumbar spine conditions from MRI scans, employing a ResNet18 backbone for feature extraction.
- Implemented image preprocessing and augmentation strategies to enhance model training and performance, supporting various image formats including DICOM, JPG, and PNG.
- Deployed the trained model on Streamlit, creating an interactive web application that allows users to upload images, receive real-time condition analysis, and download detailed reports, improving diagnostic accessibility and efficiency.

Deep Learning Model for Abdominal CT Scan Trauma Detection

- Developed a multi-label deep learning model using ResNet50 to detect abdominal trauma from CT scan images, achieving accurate classification across multiple injury types.
- Implemented advanced medical image preprocessing techniques and custom data generators to handle complex DICOM image formats, overcoming challenges in medical imaging dataset preparation.
- Utilized transfer learning and binary cross-entropy loss to create a robust machine learning solution for automated medical image analysis, demonstrating expertise in computer vision and healthcare AI.

Breast Cancer Detection Web Application

- Designed and implemented a ResNet18-based deep learning model for binary classification of histopathological breast cancer images, with custom preprocessing pipelines and augmentation techniques.
- Deployed the model with enhanced classification accuracy through fine-tuning, custom loss weighting (class imbalance handling), and adaptive learning rate scheduling.
- Achieved comprehensive evaluation using confusion matrices, accuracy metrics, and visualization of loss trends for reproducibility and interpretability.

Parkinson's Disease Prediction Web Application

- Developed a Python-based analysis pipeline to predict Parkinson's disease using machine learning models like Random Forest, Logistic Regression, and KNN, leveraging GridSearchCV for hyperparameter tuning.
- Implemented t-SNE for data visualization and correlation heatmaps to identify significant features.
- Achieved comprehensive evaluation with metrics like accuracy, recall, and confusion matrices, and deployed the best model using pickle for future use.

Cancer Detection Web Application

- Developed a deep learning pipeline for cancer detection using a fine-tuned ResNet-34 model on histopathological images.
- Implemented custom PyTorch datasets, data augmentation, and GPU-accelerated training to achieve high accuracy.
- Deployed the trained model and evaluated its performance with precision metrics, achieving efficient classification of cancerous tissues.

Pneumonia Detection Web Application

- Built a CNN-based deep learning model to classify chest X-ray images for pneumonia detection using TensorFlow and Keras.
- Utilized data augmentation, custom data generators, and early stopping to enhance model performance and prevent overfitting.
- Achieved evaluation through ROC curves, confusion matrix analysis, and key metrics, saving the model and training history for future use.

Malaria Cell Detection Using Deep Learning Web Application

- Developed a deep learning ResNet model for automated malaria cell detection using TensorFlow, achieving high accuracy in binary classification of microscopic blood cell images.
- Implemented end-to-end machine learning pipeline including data preprocessing, augmentation, model training, and web deployment with Streamlit.
- Demonstrated expertise in medical image classification, neural network architecture design, and practical AI application development.

Autism Spectrum Disorder Prediction Web Application

- Developed a machine learning solution for Autism Spectrum Disorder prediction using ensemble techniques, achieving 85% accuracy across multiple classification algorithms (Logistic Regression, XGBoost, SVM).
- Created an interactive Streamlit web application for real-time ASD screening with advanced data preprocessing.

Color Evolving Game of Life Simulation Web Application

- Developed an interactive, color-evolving Conway's Game of Life simulation using Python, NumPy, and Streamlit, featuring dynamic cellular automaton mechanics and a modern, responsive web interface.
- Implemented advanced visualization techniques with real-time color mutation and toroidal grid dynamics.

Selected Online Courses & Certifications

- Intermediate Machine Learning - [Kaggle](#)
- Data Visualization - [Kaggle](#)
- Intro to Deep learning - [Kaggle](#)
- Computer Vision (Jun. 2021) - [Kaggle](#)
- Advanced SQL - [Kaggle](#)
- Data Analysis with Python - [IBM](#)
- Data Visualization with Python - [IBM](#)
- Deep Learning with TensorFlow - [IBM](#)

Education

MBBS *KIST Medical College & Teaching Hospital*

Lalitpur, Nepal *2022-Present*

Relevant Courses: Anatomy, Physiology, Pharmacology, Pathology, Biochemistry, Microbiology, Medical Research Methods, Clinical Medicine, Public Health, and Medical Ethics

Skills

- **Programming Languages:** Python, Java, C++, HTML, CSS
- **Libraries:** Pandas, Numpy, Streamlit, PyTorch, Lightning, LangChain, Huggingface, Scikit-Learn, XGBoost
- **Software & Tools:** Jupyter Notebook, Google Colab, GitHub, Streamlit
- **Soft Skills:** Presentation, Planning, Organized, Creative Problem-Solving, Teamwork, Active Listening, Adaptability, Analytical Thinking

Languages

- | | |
|---------------------------|--------------------------|
| • English [Native] | • Nepali [Native] |
| • Urdu [Native] | • Arabic [Basic] |
| • Hindi [Native] | • Turkish [Basic] |