Muzammil Nawaz Khan
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Professional Summary

Results-driven Computer Engineering student with a strong foundation in artificial intelligence, machine learning, and image processing. Possess extensive hands-on experience in developing and implementing complex algorithms for data analysis, pattern recognition, and predictive modeling. Proficient in leveraging industry-standard tools and frameworks to design high-performing models and address intricate data challenges. Equipped with a solid educational background from the National University of Sciences and Technology (NUST) and reinforced through practical internships and personal projects, I am adept at translating technical concepts into practical solutions that drive innovation and efficiency. My expertise spans across multiple domains including biomedical AI research, data science, software development, and computer vision, enabling me to approach problems from diverse angles and deliver impactful results. With a passion for continuous learning and a commitment to excellence, I am eager to contribute my technical skills and creative problemsolving abilities to advance organizational objectives and make a meaningful impact in the field of technology.

Technical Skills

- **Programming Languages**: Python, C++, Java, MATLAB

- **Machine Learning**: TensorFlow, PyTorch, Scikit-learn, CNN, RNN

- **Deep Learning**: Transfer Learning, Computer Vision

- **Image Processing**: Medical Image Segmentation, Edge Detection, Morphological Operations

- **Tools & Frameworks**: OpenCV, NumPy, LangChain, Streamlit, Google Colab

- **Databases**: MongoDB, MySQL

Professional Experience

RiseTech - Islamabad, Pakistan

Biomedical AI Research and Development Intern — July 2024 - Sept 2024

- Developed 3D medical image segmentation models using BraTS2020 dataset for brain tumor diagnosis

- Implemented SegFormer3D and UNet 3D architectures using TensorFlow and PyTorch

- Optimized deep learning models for improved accuracy in tumor segmentation

- Evaluated model performance using dice scores and IoU metrics

- Streamlined workflows by establishing models as benchmarks for future comparisons

Projects

Luggage Threat Detection — Python, ANN, OpenCV

- Developed ANN architecture for image classification of potential threats in luggage images

- Implemented preprocessing steps including noise reduction and normalization

- Achieved high accuracy in threat identification through feature extraction techniques

License Plate Recognition — Python, OpenCV, NumPy

- Created pipeline for license plate localization using edge detection (Canny/Sobel) and thresholding

- Applied morphological operations and contour analysis for robust plate isolation

- Developed system capable of handling diverse lighting conditions

Braille Digits Recognition — Python, OpenCV, NumPy

- Built system to recognize Braille characters through dot pattern analysis

- Implemented distance metrics and size analysis for character differentiation

- Applied noise filtering to handle irregularities in dot placement

Cat Dog Classification — Python, TensorFlow/Keras, CNN

- Implemented CNN models with and without pooling and dropout layers

- Compared model performance to highlight architectural impact on accuracy

- Demonstrated regularization techniques for preventing overfitting

Skin Image Segmentation — Python, OpenCV, NumPy

- Designed segmentation system using Connected Component Labeling (CCL) and thresholding

- Applied post-processing techniques to refine segmented skin regions

- Achieved accurate results with metrics like Intersection over Union (IoU)

Retinal Image Segmentation — Python, OpenCV, NumPy

- Developed method for segmenting retinal structures using point and multi-level thresholding

- Enhanced vessel visibility through morphological operations

- Created system for precise localization of retinal objects for medical analysis

Education

National University of Sciences and Technology (NUST)

Bachelor of Computer Engineering — Nov 2021 - June 2025

- Relevant Coursework: Digital Image Processing, Machine Learning, Computer Vision

- Cumulative GPA: 3.25

Ghazali Premier College

F.Sc. Pre-Engineering — June 2018 - Aug 2020