Anirudh Narasimha Bharadwaj

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PROJECTS

Brain Tumor Segmentation using U-Net
- Implemented **3D U-Net** and **Attention 3D U-Net** with dropout, plus **TransBTS**, for **BraTS2021**, boosting **Dice**, **HD95**, and **Jaccard scores** on dual-GPU cluster.

Panoptic segmentation of nUclei and tissue in advanced MelanomA (PUMA)
- Research and implementation of a **PyTorch** based panoptic **segmentation** model with **ResNet** backbone, custom losses, and **MONAI** transforms, **tissue and nuclei analysis** on a dual-GPU cluster.

Pneumonia Classification using CNN
- Built a **ResNet-34 model from scratch** for pneumonia classification, later fine-tuning with **ImageNet pretrained weights**.
- Achieved high accuracy using **custom TinyVGG with Squeeze-and-Excitation**, demonstrating strong **Jaccard similarity performance**.

Pupil Segmentation for Eye-Tracking Application
- Developed a **custom eye segmentation model** for EquiCOG's dataset (**manual labelling** using **SAM** and **custom built PyQT segmentation application**) optimizing **real-time pupil tracking**.
- Trained **YOLO as a baseline**, designed a **TinyUNet (inspired by TinyVGG) with Squeeze-and-Excitation layers** to achieve near comparable results with slightly improved efficiency.

WORK EXPERIENCE

Computer Vision Engineer, Equidor Medtech LLP — Jan 2024 – Dec 2024, Bengaluru, India
- Collaborated in desigining, developing, and optimizing an eye-tracking algorithm for real-time simultaneous tracking with 120Hz binocular cameras using OpenCV.
- Applied advanced OpenCV techniques to enhance image analysis workflows, improving performance across hardware and software components.
- Developed algorithms for real-time oculomotor data analysis, enabling precise diagnostic capabilities.
- Conducted research for torsional component detection, advancing the system's ability to identify complex eye movements.
- Designed and implemented a production-level Camera Tool using PyQt, streamlining camera setup, alignment, and testing for device quality control.
- Built an Encoder Tool with PyQt and FFmpeg, leveraging hardware acceleration.

Computer Vision Consultant, Equidor Medtech — Jun 2023 – Jan 2024, Bengaluru, India
- Conducted research on a state-of-the-art eye-tracking engine for enhanced performance.
- Developed skills in image processing, computer vision, research, computer architecture, parallel computing, problem solving and algorithm development.

Research Intern, Cyclops Medtech Pvt. Ltd. — Sep 2022 – May 2023, Bengaluru, India
- Analyzed real-time ocular movement dataset to improve accuracy of computer vision algorithms.
- Developed proficiency in Python and utilizing tools such as Pandas, NumPy, and OpenCV for data analysis and image processing.

EDUCATION

Master of Science in Computer Vision,
University of Central Florida
Jan 2025 – Jan 2027 | Orlando, Florida
Coursework: Medical Image Processing, Machine Learning, Image Processing
4.0 / 4.0 GPA (*current***)**

B.Engg - Electronics and Communication,
S J B Institute of Technology
2019 – 2023 | Bengaluru, India
Affiliated to Visvesvaraya Technological University (VTU)
3.50 / 4.00 GPA

CERTIFICATES

PyTorch for Deep Learning Bootcamp, Deep Learning with PyTorch for Medical Image Analysis, Deep Learning using Medical Data, A.I. & Machine Learning Bootcamp

SKILLS

Programming*:* Python, C++, MATLAB
Computer Vision and Deep Learning*:* PyTorch, MONAI, Optuna, OpenCV, MedPy, wandb, TensorBoard
Data: NumPy, Pandas, Matplotlib, Scikit-learn, SciPy
Tools and Platforms*:* PyQt, Linux, Git, GPU Cluster

AWARDS AND ACCOMPLISHMENTS

Awarded for Contributions to ***Assessment and Rehabilitation of Vertigo and Balance Disorders***, Department of Otorhinolaryngology - Head & Neck Surgery, Yenepoya Medical College(Deemed to be University), Mangaluru, India.