Anirudha N Shastri

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EDUCATION

Northeastern University, Boston, MA — August 2022 - December 2024
Khoury College of Computer Sciences
Masters in Artificial Intelligence

Dayananda Sagar University, Bangalore KA — August 2018 - June 2022
Bachelor's in Technology (B-Tech),
Concentration: Computer Science and Engineering.

Profile / Research Interests

- **Research Focus** – Advancing AI-driven healthcare through applications in medical imaging, diagnostics, and treatment planning. My work focuses on developing robust and interpretable models for clinical decision support, with a growing interest in extending these methods to genetics and other data-driven areas of precision medicine.

Research Experience

Memorial Sloan Kettering Cancer Center, New York NY — January 2025 - Present
Senior Research Technician, Department of Interventional Radiology

- **Foundational Registration (Lung Microwave Ablations)**
  - Applied a foundational registration model to lung ablation cases, optimizing parameters and data inputs for domain-specific dataset.
  - Conducted extensive experiments to evaluate model robustness and identify optimal configurations for institutional datasets.
- **Fracture & Lesion Detection on an institutional Hip Dataset (Detectron2)**
  - Developed an end-to-end computer vision pipeline using Detectron2, covering dataset preprocessing, training, and evaluation.
- **Diffusion Models for Lung Tumor Segmentation**
  - Implemented a diffusion-based framework for human-assisted tumor segmentation.
  - Designed a simulated workflow integrating human interaction for Lung tumor segmentation, currently tested on 2D and 3D datasets.

Unravel Bioscience, Boston, MA — June 2023 - December 2023
Computational Drug Discovery Intern

- Elevated the proprietary **tadpole tracking system** to enable **precise individual tadpole tracking**, surpassing previous group tracking limitations.
- Expanded the spectrum of validated metrics from **3 to 7**, empowering the laboratory to conduct comprehensive assessments of tadpole behavioral patterns.
- Revamped the codebase by segregating computer vision and post-processing components, resulting in a highly scalable tracker capable of accommodating an increased volume of experiments.
- Engineered a custom diagnostic tool, characterized by **ECG-like functionality**, purpose-built to monitor metrics associated with tadpole movement.

Publications, Presentations & Patents

- **Radiological Society of North America (RSNA) 2025 — *Abstract: Hip fracture & lesion detection using Detectron2.***
- **SPIE Medical Imaging 2025 -** *Interactive Lung Tumor Segmentation using Denoising Diffusion Probabilistic Models*
- **SPIE Medical Imaging 2025** - *Comparing Bspline and UniGradICON-AI Foundational Deformable Image Registration Methods: Evaluating the Tradeoff Between Accuracy and Speed*
- **Patent:** Automated Cervical Vertebral Staging to determine skeletal maturation using Lateral Cephalograms, Indian Patent Office, Application No. 202541002362, Published Jan 2025.

Research Projects

Final Year Project (B-Tech), Dental Assistance Tool |Python, JavaScript, SQL, OpenCV, Deep Learning January 2022 - June 2022

- Led a team of 5 in developing an AI-powered dental diagnostics platform at Dayananda Sagar University, which later facilitated a Memorandum of Understanding (MOU) between the Computer Science Department and the Dental College.
- Conducted 5 presentations to spread awareness and understand the power of AI in healthcare to dental professionals.
- Collaborated with dental professionals and led a team to conduct requirement surveys, identifying three key ideas for further investigation.
- The platform reduced dental x-rays analysis and annotation time from 30-45 minutes to 3-5 seconds, it was also able to collect over 2500 images to train these models.
- **First Place** (1st of 97 projects), Dayananda Sagar University Project Expo 2022

Landmark Detection for Bone Age Prediction| Python, OpenCV, TensorFlow January 2021 - December 2021

- Implemented a deep learning program for the localization of 19 key points on a Lateral Cephalogram for bone age prediction by Cervical Vertebral Staging (CVS).
- Incorporating the use of tools into daily diagnostics can help with time deficiencies and human error. Developed and executed a landmark localization model using an innovative hourglass architecture, achieving a remarkable accuracy of 87% in localization of 19 points.
- Designed custom Annotation tool for Dental Research |Python, OpenCV: For the above research, developed a custom tool for the collection of 400 annotated x-rays to train custom deep learning models.

Masters ML Course Project, CVS Staging Platform Rebuild | Python, TensorFlow, OpenCV January 2024 - May 2024

- Developed a new CVS staging platform using U-Net and InceptionResNetV2 architectures to significantly improve predictive accuracy and location precision over the previous hourglass-based model. The prior model only accurately predicted 87% of key points, whereas the new implementation now predicts 100% of points within the desired location range.
- Conducted experiments with distinct color spaces and applied extensive hyperparameter tuning to optimize model performance, resulting in significant gains in accuracy and robustness.
- U-Net reached 85% Accuracy Percentage Correct Keypoints (PCK) with a Dice Loss of 0.25. InceptionResNetV2 attained a 75% Accuracy (PCK) and MAE of 15.2

Professional Experience

nference, Bangalore, KA, India February 2022 - April 2022
Computer Vision Intern

- Designed an OCR (Optical Character Recognition) Pipeline leveraging Pytesseract and CRAFT for digitizing thousands of handwritten labels on older pathology slides.
- Developed an algorithm for the detection of KI-67 markers for Breast Cancer Detection using computer vision, for the reduction of time taken for manually counting the number of nuclei in a slide.

Technical Skills

Technical: Python, C, C++, OpenCV, Java, JavaScript, HTML, MATLAB, SQL, GCP, Amazon Web Services, ML & deep learning, Git, TensorFlow, PyTorch, NodeJS, CSS, SimpleITK, MONAI

Additional Information

- Selected for pre-incubation training at Healthcare Hackathon for an AI-powered heart monitoring device.
- Guitarist (school/university bands).