Akansh Maurya

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Education

Universität des Saarlandes **April. 2023 – April 2025**
Masters in Visual Computing *Saarbrücken, Germany*

Institute of Engineering and Technology **Sep. 2017 – July 2021**
Bachelor of Technology in Electrical Engineering ***CGPA: 8.69/10*** *Lucknow, India*

Experience

Interdisciplinary Institute for Societal Computing **April 2023 – Present**
HiWi(Research Assistant) *Saarbrücken, Germany*

- Working with **Prof. Ingmar Weber**. My task lies in the intersection of Visual computing and societal computing.
- Detection of vehicle density in medium-resolution satellite image for understanding the migration pattern.

Sony Research India **Sept 2022 – Feb 2023**
Healthcare Machine Learning Researcher *Bengaluru, India*

- Built **AI-powered** solution for detection of Chronic obstructive pulmonary disease(**COPD**) from thermal images.
- Prepared clinical **data collection SOW**, Reviewed 12+ vendors
- Collaborated with **IIT KGP** for data collection using the novel temperature-based sensor.

Robert Bosch Center for Data Science and Artificial Intelligence **Sept 2021 – Sept 2022**
Post Baccalaureate Research Assistant (RBCDSAI, IIT Madras) *Chennai, India*

- Worked under the guidance of **Dr. Ganapathy Krishnamurthi** to make interpretable weakly-supervised DL algorithms to detect and localize multiple abnormalities in Chest X-rays.
- **2 research papers** accepted at an International conference(**MICCAI 2021 and ISBI 2023**). **1 journal paper** under review at the International Journal of Biomedical Imaging.
- **Secured 3rd position** in Chest XR COVID-19 detection Grand Challenge among 200 teams.
- **Secured 13th position** in Pulmonary Artery Segmentation Challenge 2022 among 460 participants.

Indian Institute of Science (IISc) **Oct 2020 – May 2021**
Research Intern (Signal Processing Interpretation and REpresentation (SPIRE) Laboratory) *Bangalore, India*

- Worked under the guidance of **Dr. Prashanta Kumar Ghosh** to build an app that can help detect an asthmatic patient based on cough sound and sustained phonation. I pre-processed 285 patient recordings for feature engineering and calculated statistical features on MFCCs and their derivatives to train classifiers like Support Vector Machine, XGB.
- My research finding includes: Wheeze sound best classifies Asthmatic patients with 86% Accuracy; Gender classification from breath signal with AUC score of 88.59%; proof of decrease in the quality of sound in Asthmatic Patients.
- Identified that 25% to 75% chunk of whole breath signal is priamarly responsible for detecting Asthmatic patients.
  Certificate — Presentation

Indian Institute of Technology(IIT), Bombay **May 2020 – July 2020**
Research Intern (Embedded Real Time System(ERTS) Labs) *Mumbai, India*

- Under the supervision of **Prof. Kavi Arya**, I developed a Deep Learning-based web app that automates verifying and validating of ID card images; It reduced the processing time from 14 days to 3 hours.
- Developed a RotateNet model that corrected orientated images, improved OCR results on rotated images, implemented text detection and recognition with DBNet and CRNN, and got 27 fps speed to process images.
- I coded a custom fuzzy string matching algorithm to validate text present in the ID card. F1 score of the whole system is 0.90054. Certificate — Report — Video

Publication

- Shambhat V, **Maurya A.**, Krishnamurthi G. et al. (2021). "A study on Criteria for Training Collaborator Selection in Federated Learning." (Accepted in **MICCAI BrainLes 2021**) **Link**
- **Maurya A.**, Krishnamurthi G. et al. (2022). "PARSE challenge 2022: Pulmonary Arteries Segmentation using Swin U-Net Transformer(Swin UNETR) and U-Net" (arXiv:2208.09636) (Accepted in **ISBI 2023**)
- R Sidharth, **Maurya A.**, Krishnamurthi G. (2023). "COVID-19 detection from Chest X-Ray images: A Survey" (Under Review at IJBI)
- **Maurya A.**, Manjrekar O., Arya K., et al. (2020). "A system for verifying non-standard personal identity documents using deep learning models."(Submitted ICDAR-IJDAR, 2021 journal track).

Technical Skills

Languages: C, Python, MATLAB.
Python Libraries: Pytorch, TensorFlow, OpenCV, Robot Operating System(ROS), Numpy, Matplotlib, Pandas, Librosa
Technologies/Frameworks: Linux, GitHub, Computer vision, Deep Learning, Audio Processing, Time-series Analysis

Leadership / Extracurricular

- Served as Joint Secretary at Electrical Engineering Society(EES), IET Lucknow, organized 5 research talks and 2 technical workshop for students.
- Served as a Volunteer and Academic Assistant of Parmarth- the social club of IET Lucknow; I taught children of slums nearby college, conducted cloth and food distribution to the needy.
- Like to play Chess(ELO 1486), badminton and Kho-kho; I also participated in many inter-college events.

Projects

Survey & Rescue Drone | *Control Systems, ROS, Python, OpenCV* **February 2020**

- Designed a prototype to mimic the flood affected region and programmed a drone that can autonomously navigate in the flood-affected region to distribute supplies.
- Used Robot Operating System(ROS) for programming custom path planning algorithm with Drone, used PID controller to control drone movement.
- Implemented Image processing Algorithm using OpenCV to detect regions of flood and points of distress.
- My team secured 5th position among 1050 teams internationally.

Lung Segmentation from Chest X-Rays | *Deep Learning, Python, Pytorch, PyDicom* **October 2021**

- Used Montgomery County X-Ray dataset, which contains only 138 posterior-anterior x-rays. Performed rigorous augmentation techniques to increase the number of data points and generalization.
- Created U-Net, with Resnet 50 as a backbone; Achieved the dice score of 97.67% on test set.

Fovea Localization for AMD & Non-AMD patients | *Python, Pytorch, OpenCV* **April 2021**

- This project is part of ADAM competition. Accomplished localization of Fovea, inside the human eye.
- Attained decent accuracy of 60% on small dataset of 400 images by different custom data augmentation techniques.

Automated measurement of fetal head circumference | *Python, Pytorch, Pandas, Numpy* **March 2021**

- Worked on ultrasound images to detect and segment the fetus head to monitor its growth(medical imaging problem).
- Implemented encoder–decoder model, dice loss, got accuracy of 93%

Genetic Algorithm from scratch using MATLAB | *Optimization, MATLAB* **December 2019**

- This project was guided by Dr. Nitin Anand Shrivastava.
- Coded Genetic Algorithm functions like selection, crossover, mutation and elitism using MATLAB to solve simple load dispatch problem.

Referral

- Dr. Ingmar Weber, Alexander von Humboldt Professor in AI at Saarland University
- Dr. Ganapathy Krishnamurthi, Associate Professor at IIT-Madras
- Dr. Nitin Anand Shrivastava, Assistant Professor at IET Lucknow
- Dr. Pushkar Tripathi, Assistant Professor at IET Lucknow