Mustaffa Hussain

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https://mustaffa-hussain.github.io/Portfolio/
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EDUCATION

Qualification	Institution	CGPA/Percentage	Year Of Pass
M.Sc Computer Science	South Asian University	6.85 / 75%	2019
B.Sc Computer Science	Central University of Rajasthan	4.80 / 68%	2017

SKILLS

- **Programming Languages:** Python, C, C++
- **Frameworks:** Pytorch, Tensorflow, Pytorch lightning, Keras
- **Data Science :** Computer Vision, NLP, NLTK, Opencv, Numpy, Pandas Scipy, NER, GraphDBs, Flask Restful APIs, Git, Docker, Skimage, Flair,
- Models: Recommendation, Regression, Classification, Detection, Segmentation,
- **Relevant Coursework**: Machine Learning, Statistics, Optimisation & Data Structures and Algorithms, Theory of computations, Operating systems

PROFESSIONAL EXPERIENCE

Onward Assist : https://onwardassist.ai/ Hyderabad,IN

Machine Learning Scientist Dec 2020 - Till Now

Summary: I lead a team of 6 data scientists and work primarily with building AI algorithms on medical data like Patient records, CT dicoms, Whole slide Images bigTiffs, etc. I am also leading the efforts on Clinical trials which are 4 breast panel algorithms. Here are some of my work.

- Grading Whole Slide Images(WSIs >= 100000x100000 pixels) for breast cancer cells on ER, PR, KI67 and HER2 . Deal with underlying differences in IHC staining via stain normalization. Utilised cell segmentation for identification of intensity. Took inspiration from various architectures such as Unet, hovernet, etc to implement novel techniques. Tasks involved getting data from hospital, getting them annotated from the pathologist, and undergoing blind study via feedback from the board of doctors and pathologist regularly. I lead the efforts of **clinical trials** and white papers and tools are targeted for FDA approval.

- Automated the extraction of critical tumor information, enabling quicker and more accurate patient classification for treatment. Extracted tumor characteristics from anonymised patient pathology reports from Hospital records. Trained a custom HunFlair NER model to identify and classify entities related to tumor characteristics. Extracted the characteristics to form a database of size, grade, location, etc to build an in-house model for survivability and tumor recurrence. Concordance study within image-based clinical study model reveals strong Kaapa.

- Coregistration of 3D CT and 3D PET scans (DICOM & NIFTI series) of mouse and segmentation of bed and plastic nose from the test subject. The raw scans were of different sizes where CT modality were of 600x600x600 and PET modality were of 191x240x240 where the order is [Depth x Width x Height]. Implemented a combination of linear and affine transformations from fiducial tubes localisation for coregistration. The segmented plastic nose and bed were removed from the scans and each mouse was cropped out resulting in 4 coregistered CT and PET scans. The work reduced the turn around time of the radiologist by 80% on a single scan of 4 test subjects.

Myways : https://myways.ai/ New Delhi,IN

Machine Learning Trainee May 2020 - Dec 2020

- Concepted Employability Positioning System(EPS). Developed knowledge graphs for horizontal and vertical career trajectories, skills, online courses, and book recommendations on NetworkX as POC. Deployed using Flask and Neo4j backend, integrated DoSelect(exam) API.
- Developed visualisation boards for careers, courses, and skills from 100 GB of textual data. Serving analytics plots and data via Flask Rest APIs.
- Trained NER and sentiment analysis models for customer feedbacks, books recommendations etc.
- Data wrangling from LinkedIn, Naukri, Internshala, etc for generation of leads for business team via automated cronjobs and crawlers.

South Asian University Machine Learning Lab New Delhi,IN

Graduate Research Assistant Jul 2018 - Mar 2019

- The project investigates Multi-Task learning in SVMs.The project involved reading research articles, papers and devising a solution to improve the existing models in use. Successfully developed a novel Multi-Task Learning framework based on Twin support vector machines under the supervision of Dr. Reshma Rastogi.

TECHNICAL WRITEUPS

- Switched auxiliary loss for robust training of transformer models for histopathological image segmentation.
- Robust Multi-Domain Mitosis Detection via Unpaired domain generalisation- MICCAI 2021 proceedings.
- Rastogi, Reshma, and Mustaffa Hussain. "Robust Multi-task Least Squares Twin Support Vector Machines for Classification." Advanced Machine Intelligence and Signal Processing. Singapore: Springer Nature Singapore, 2022. 393-405.

PROJECTS AND LEADERSHIP

Technical Project: Computer Vision

- **KEYE-** developed the product K-EYE which enables real-time safety protocol monitoring, and automation of detected anomalies. The scope includes metal ore processing/production Industrial setup. The work looked at PPE kit violations, fire detection, spillage of liquids, crowd detections, and lane detection etc on real-time video feed from multiple IP cameras.
- **Deep learning Tutorial**- Setup tutorial notebooks for various computer vision models from classification, and segmentation to pose estimation, etc. I also explored model optimisation at inference with quantisation and various generative models.

Blogging: TheCyPhy@Medium

- Started a publication on Medium named TheCyPhy. We are 20+ writers and have 35+ published articles in the domain of ML and DL.
- Some of the articles from TheCyPhy are ‘Impression Generation From Medical Imaging Report’, ‘Deploy Deep Learning Model Using Docker, Tensorflow Serving, Nginx and Flask’,’Knowledge Graph-based ChatBot’,’Test drive with YOLO v4’,’Training Custom NER Model Using Flair’ etc.

OTHER ACHIEVEMENTS

- Table Tennis and Badminton: Singles and Doubles winner in Intra University tournament.
- NCC: certificate A,B,C holder.
- Represented school at CBSE zonal meet for Hockey.