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ABOUT ME

I am a Data scientist at Aindra Systems. I have very good command over Python, Matlab, Deep learning and machine learning frameworks. With passion and avid interest towards medical domain and AI applications, I have worked with deep learning and computer vision applications related to medical domain and I have developed skill set related to medical imaging and application of AI frameworks to various imaging modalities (MRI, CT, Microscopic images). Can work well with a team as well as individually with sparkling vigour.

WORK EXPERIENCE

Data scientist

Aindra Systems [21/09/2022 – 20/10/2023]

City: Bangalore

Country: India

Main task: To diagnose Cervical cancer in conventional pap smears and LBC microscopic images using AI techniques, implement optical flow mechanism to improve image scanning.

I have implemented pipeline to download data from GCP cloud, extract features and train a deep learning model with the data from various hospitals.

I have used a weakly supervised deep learning approaches, GCNs as well as Transformer based networks to classify whether the given WSI is cancerous or not (still working on improvements).

I have implemented color normalization techniques using MONAI framework and noise separation algorithm using computer vision techniques.

I have also worked on image processing techniques in order to increase the scan time by controlling electronic component and camera movements using C++ SDKs.

Lead a team of Junior data scientists for tasks such as segmentation and grade assessment for other cancer types.

Tools: Tensorflow, VIPS imaging library, OpenCV, MONAI, PyTorch, C++, TensorFlow.

Junior Computer Vision Engineer

Arspectra [01/03/2022 – 01/06/2022]

City: Foetz

Country: Luxembourg

Main activities: My task is to create a tool to visualize 3d models and to interact using gestures, in augmented reality based headsets and interact with 3d objects using gesture tracking.

I have created a visualization tool using Vulkan SDK for 3d models using C++ for Linux based systems and integrated gesture models to interact with miniature 3d models using OpenGL.

Tools or softwares used: OpenGL, Vulkan SDK, Tensorflow, Opencv, Android studio, C++, Python.

Intern

Fraunhofer [01/04/2021 – 28/02/2022]

City: Erfurt

Country: Germany

The project is about identifying lung cancer using Breathgas analysis. I developed a hybrid deep learning model (VGG16 + SVM) to classify lung cancer or no lung cancer and identify Bio markers or volatile organic compounds present in the breath gas using Explainable AI techniques. I dealt with chromatograms as input.

I developed GUIs using pyqt5 and employed machine learning frameworks and deep learning frameworks(pyTorch, tensorflow)

HiWi

Otto-Von-Guericke university [01/04/2021 – 30/01/2022]

City: Magdeburg

Country: Germany

Main activities:

Liver cancer CT scan reconstruction with reduced noise using deep learning techniques. I have used Hounsfield normalization technique for DICOM image normalization and FBP reconstruction technique along with addition of poisson noise to generate noisy input images.

Developed UNet based model to reconstruct noise reduced CT scans from noisy images

Worked in collaboration with DKFZ cancer research center.

I was responsible for developing pipelines using pytorch.

EDUCATION AND TRAINING

PhD

Norwegian University of Science and Technolog [20/11/2023 – Current]

City: Trondheim

Country: Norway

Website: <https://www.ntnu.no/>

Master (GPA-1.8)

Otto- Von- Guericke university [14/10/2019 – 29/08/2022]

Address: Universitätsplatz 2, 39106 Magdeburg (Germany)

Website: <https://www.uni-magdeburg.de/>

Bachelors in Electrical and Electronics Engineering

Andhra University [01/08/2014 – 01/04/2018]

Address: Waltair Junction, 530003 Visakhapatnam (India)

Website: <https://www.andhrauniversity.edu.in/college/college-of-engineering/engineering-departments.html>

DIGITAL SKILLS

Machine learning / Computer vision / Android studio / Deep Learning

Programming

Shell scripting(Intermediate) / Embedded C / MATLAB(Advanced) / C++ / Python(Advanced) / Remote clusters and GPU / Git / Basics of MySQL

Softwares

Microsoft Office / FSL, ImageJ, Alija (preprocessing softwares) / AnyLogic / Ubuntu and windows / Latex / PyCharm , Google Colab / Linux - GNU/Linux server

Frameworks

Tensorflow / PyTORCH / PyQt5(GUI development) / Android studios / Arduino, 8051 / Image Processing (OpenCV, SITK) / DICOM, Nifti / OpenGL (Basics) / Vulkan SDK (Basics)

PROJECTS

Deep Learning Techniques for Vulvar Cancer Detection in Tissue Micro Arrays (Master's thesis)

[01/07/2021 – 13/05/2022]

As part of curriculum I worked on "Deep Learning Techniques for Vulvar Cancer Detection in Tissue Micro Arrays" as master's thesis. It contains three parts:

1. Classification: Classifying the extracted patches from tissue micro arrays. I developed an ensemble based architecture using transformers and graph convolutions for this purpose. (Accepted at SPIE medical imaging conference 2023).
2. Segmentation: Identifying the cancerous and non-cancerous regions in tissue micro arrays using segmentation maps. I employed an existing modified UNet based i.e., UNet with VGG16 backbone and attention module.
3. Estimating cell count: Estimate the number of cancerous cells in the given tissue micro array using regression based models. For this I have used Support Vector Regression for counting number of cancerous cells.

Link: <https://doi.org/10.1117/12.2653858>

Optimizing traffic safety using simulation model(6cp project)

[20/04/2020 – 07/08/2020]

We as a team of 6 have developed a simulation model using Anylogic software and tried to optimise the traffic conditions at a given node. Data is given by Magdeburg city office. My role in the project is to analyze the given data(Data Analyst) and find underlying statistical distributions of each traffic node.

Super resolution of 3D diffusion weighted MRI images (additional project)

[01/07/2020 – 01/02/2021]

We as a team of 4 employed various deep learnig architectures we modified and developed a novel UNET model.I have lead the team for developing a working pipeline for deep learning models and contributed the most in developing novel architecture. Paper has been accepted at EUSIPCO 2021 conference and published in IEEE conference proceedings.

Link: <https://arxiv.org/pdf/2102.12898.pdf>

Study of response of immune system in poly trauma patients using dynamic immune cells data and Static clinical data(individual scientific 12 cp project)

[01/08/2020 – 01/03/2021]

This project have two parts. In first part of this project I have employed deep learning architectures for classification whether the patient will have a complication(SIRS) or no complication for dynamic time series immune cells data and In second part of the project I have emplyed various machine learning algorithms for averaged 3 days clinical data(static)to classify between infectious and no infectious complications and I have also employed explainable AI for identification of important biomarkers. (In review process with frontiers for immunology Journal).

Link: <https://doi.org/10.3389/fimmu.2023.1281674>

Classification of various hand movement for a calibrated data recorded using a glove(individual voluntary project)

[01/03/2021 – 01/11/2021]

My task is to classify various hand movements recorded using glove. I have developed an LSTM based classification model using MATLAB.

The project is from Leibniz Institute for Neurobiology Magdeburg.

Link for the publication :

Link: <https://www.mdpi.com/1424-8220/22/16/6101>

Derived Data prediction for diffusion weighted imaging(additional project)

[01/04/2021 – 13/10/2021]

It is continuation of Super resolution of DWI images project and here we as a team of 3 have implemented various deep learning algorithms to obtain derived data and diffusion tensors from given B0 volume or T1 or T2 volumes and also generating brain tracts. We also developed a GUI for the entire pipeline using PyQt5 library

Brain computer interfacing lab

[01/11/2020 – 31/01/2021]

It is an academic project as part of experimental neuroscience seminar. Have done preprocessing of signals using fourier transform and applied machine learning frameworks for classifying the frequency of unknown spectrum.

Android development

[07/04/2021 – 03/07/2021]

As part of academics we as a team of 5 are developing an android app and the theme is Money control. In order to have an idea of the expenses and income and to control the expenditure

TEMPERATURE SENSING AND GPS TRACKING USING DRONE FOR DETECTION OF OVER TEMPERATURE DUE TO NEGATIVE SEQUENCE FAULTS

[01/09/2017 – 01/04/2018]

It is a Bachelor project. We as a team of 7 have designed a quadcopter and assembled and mounted a thermal camera in order to sense the overheated parts in the electrical equipments . We have published a paper after few major modifications

Link: <http://www.ijrat.org/downloads/Vol-6/july-2018/paper ID-67201862.pdf>

Obejction detection and privacy preserving localization using raspberry pi(voluntary participation)

[15/04/2021 – 30/07/2021]

Obejction detection using opencv and applying privacy preserving localization techniques on sensors using raspberry pi.
