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Summary

Detail-oriented AI and Data Science professional with a robust background in developing cutting-edge solutions in computer vision, deep learning, and data privacy. Proven track record of improving operational efficiencies and compliance in clinical data environments. Seeking to leverage my skills and experience to contribute to innovative projects in the data science and AI sectors.

Experience

Unify.ai — *May 2024 - Present*

Open Source Machine Learning Contributor

- Contributing to the development and maintenance of open-source machine learning projects.
- Collaborating with the community to identify and resolve issues, improving project reliability.
- **Tools & Technologies:** Machine Learning, Python, TensorFlow, PyTorch, Git.

mediMESH - Clinical Insights, Magdeburg, Germany — *March 2023 - Present*

Artificial Intelligence Engineer

- Advanced from **Research Assistant** to **AI and Software Engineering Work Student**, spearheading AI innovations in clinical data privacy.
- Developed a cutting-edge **anonymization pipeline**, reducing processing time from 3 days to less than 7 minutes (**99.84% improvement**) using Detectron2, YOLO, SAM, Docker, and OpenCV.
- Implemented custom face detection modules and streamlined annotation with CVAT, enhancing accuracy and compliance with privacy standards.
- Managed system administration and data workflows, ensuring seamless operation and data format integration (COCO, CVAT 1.1).
- **Tools & Technologies:** Detectron2, YOLO, SAM, Docker, OpenCV, CVAT, Python, PyTorch.

CemtrexLabs, Pune, India — *July 2020 - August 2020*

Data Science Intern

- Generated and cleaned the dataset from **open source images** required for the video analytics project.
- Improved the transfer time of large datasets from 2 mins for 100 images to less than 1 sec for 100 images (**99.17% improvement**) by creating Python APIs.
- **Tools & Technologies:** Python, Image Processing, Remo tool, COCO dataset, Open-Images.

Knowledge Solution India, Pune, India — *May 2020 - June 2020*

Data Science Trainee & Intern

- Project: Real-time COVID-19 Forecasting.
- Visualized and analyzed the dataset using Matplotlib and Seaborn to recognize patterns & trends in the data.
- Predicted the potential COVID-19 cases in different regions of India using the **Linear Regression algorithm.**
- **Tools & Technologies:** Python, R, Pandas, Numpy, Matplotlib, Seaborn, Scikit-Learn.

Athens Information Technology, Greece — *June 2019 - July 2019*

Undergraduate Fellowship Summer Project and Research Program

- Project: Blockchain support for Transportation of Sensitive Goods using IoT.
- Implemented a Blockchain PoC for the transportation of Wine through a decentralized **Ethereum** network.
- Used IoT sensors to track the temperature and luminosity data for maintenance of the quality of Wine.
- Used **MetaMask** wallet as a payment gateway.
- **Tools & Technologies:** Ethereum Blockchain, Solidity, Go, Javascript, HTML, CSS, MetaMask.

Education

Otto Von Guericke University, Magdeburg, Germany — *April 2022 - Present*

Master of Sciences - Data and Knowledge Engineering

- Grade: 1.9
- **Subjects:** Machine Learning, Introduction to Deep Learning, Data Mining, Recommenders, Deep Learning for Computer Vision, Cloud DevOps, Visual Analytics, Advanced Database Modules, Distributed Data Management, Principles & Practices of Scientific Writing.

Dr. D. Y. Patil Institute Of Engineering Management And Research, Pune, India — *July 2017 - July 2021*

Bachelor of Engineering - Computer Engineering

- Grade: 1.4
- **Subjects:** Data Structures, Database Management Systems, Data Analytics, Data Mining, Machine Learning, Artificial Intelligence.

Projects

Multi-Perspective Video Analysis System - Master Thesis *January 2024 - Present*

• Developing a comprehensive video analysis system for **object tracking** and **activity analysis** across multiple camera views in a healthcare environment.
• Created a custom **YOLO** object detection model for the hospital environment.
• Implemented single-camera tracking algorithms as a foundation for future **multi-perspective tracking**, addressing occlusions and variable lighting.
• Designed a report generation module with visualizations like **heatmaps**.
• Ensured data security and privacy compliance with healthcare standards.
• **Tools & Technologies:** Object Tracking, Deep Learning, Machine Learning, Image Processing, Computer Vision, Python, PyTorch, TensorFlow, YOLO.

Validating Attribution Techniques (Group Project) *May 2023 - September 2023*

• Implemented attribution methods including **GradCAM**, **SmoothgradCAM++**, **ScoreCAM**, and **LayerCAM** on models like **ResNet18**, **ResNet50**, **VGG16**, and **InceptionV3**.
• Conducted **occlusion-based perturbation** and **adversarial noise assessment** to identify vulnerabilities in attribution methods.
• Generated over **16,000 perturbed images** from 113 samples for robust experiments.
• Developed and integrated evaluation metrics such as **Pearson Correlation Coefficient**, **Earth Mover's Distance**, and **Normalized Scanpath Saliency**.
• Verified vulnerabilities using the **Captum library** and compared results with state-of-the-art metrics.
• **Tools & Technologies:** Deep Learning, Image Processing, Computer Vision, Python, PyTorch, TensorFlow.

System for Waste Management: Smartzzy *October 2020 - June 2021*

• Spearheaded a team of 3 to build a system for **waste segregation** using **Deep Learning**.
• Built a **Sequential CNN** model for waste classification using image data.
• Integrated the model with **Raspberry Pi**, developing a prototype.
• **Tools & Technologies:** Machine Learning, Image Processing, Computer Vision, Deep Learning, IoT, Raspberry Pi, Google Cloud, Flask, TensorFlow, Keras, Python.

Farmers' Mart *January 2020 - August 2020*

• Created an **F2C** (Farm Direct Marketing) platform with a **recommendation system** for farmers and consumers.
• Developed an **LSTM algorithm** for future price prediction of crops and developed web pages using **Flask**.
• Built a **hybrid recommendation module** for consumers to recommend the best farmer.
• **Tools & Technologies:** Data Science, Machine Learning, Deep Learning, Blockchain, Flask, IoT.

Skills

Programming Languages	***Experienced:*** Python | C++ ***Intermediate:*** Java | Solidity | SQL | R | Shell Scripting | Go | HTML/CSS | JavaScript
Data Science	Machine Learning | Deep Learning | Computer Vision | NLP | Recommender Systems
Software Development	Programming Paradigms | GIT | Agile Methodology | DevOps Lifecycles | Docker
Frameworks & Libraries	Flask | Streamlit | TensorFlow | Keras | PyTorch | Scikit-learn | OpenCV | Captum | MLflow | Matplotlib | Numpy | Pandas | Tensorboard
Databases	Oracle | MySQL | MongoDB
Operating Systems	Windows | Linux | macOS | Raspbian
Microsoft	Excel | Outlook | PowerShell
Languages	***Native:*** Hindi | Marathi | Telugu ***Fluent:*** English ***Beginner:*** German

Certifications

- **Microsoft:** Microsoft Technical Associate for Introduction to Programming Using Python.
- **Coursera:** Programming for Everybody (Getting Started with Python) by the University of Michigan.
- **Coursera:** Python Data Structures by the University of Michigan.
- **Coursera:** Using Python to Access Web Data by the University of Michigan.

Achievements & Co-curricular Activities

- **Patent Name: Smartzzy**, Application number: 202121011507, Region: India, Status: Published (Sep'22).
- **Patent Name: Smart Parkade**, Application number: 202121011511, Region: India, Status: Published (Sep'22).
- Runner up in **Smart India Hackathon** conducted in DYPIEMR (Feb'20).
- **Smart India Hackathon** - 2020 finalists - Top 5 projects from India (Aug'20).
- Runner up of **Mini Project Exhibition** conducted in DYPIEMR in association with ACM (Oct'19).
- Finalist in the Hackathon "**Solve for Safer India**" organized by Indian Road Safety Campaign, Ministry of Road Transport & Highway, United Nations of Training & Research, IIT Guwahati, & Robert Bosch Engineering (Apr'19).