FAIZ MUHAMMAD CHAUDHRY

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Location: Tampere, Finland

*As an experienced **Machine Learning Engineer**, skilled in deep learning, computer vision, image processing, Large Multimodal Models (LMM), model deployment, and synthetic data generation, I am proficient in Python, PyTorch, Docker and have a strong experience with multimodal large language models, object detection, camera calibration, scene understanding for ADAS, LiDAR, sensor fusion, 3D simulation environments, and high-performance computing (HPC).* I have recently published a peer-reviewed paper DeepBrownConrady in IEEE-TASE, as the first author. Additionally, *I am experienced with SLURM workload management, cloud infrastructure (AWS, GCP), large-scale data processing, and version control with Git.*

Professional Experience

AILiveSim Ltd, Finland.
Machine Learning Engineer **October 2022 – Present**

- Built an asset description and retrieval pipeline using Unreal Engine metadata, integrated LongCLIP for multimodal encoding, and stored embeddings in a Chroma vector database for fast similarity search.
- Generated synthetic data resembling real datasets by tweaking parameters in 3D environments.
- Developed an Object Detection model for the Maritime Environment using Synthetic Data.
- Engineered a sophisticated decomposition technique within the ResNet model, focusing on the computation of projection matrices and orthogonal components tailored for PCA analysis.
- Implemented camera calibration using single images from simulated data to predict horizontal field-of-view (H-FOV), Brown-Conrady distortion parameters, and calculated the intrinsic camera matrix (K-matrix).
- Generated LiDAR point clouds and performed voxelization to enhance scene understanding in simulated environments.
- Leveraged LLaVA/LLaMA large language and multimodal models to automate scene descriptions and improve AI interaction with simulated scenes.
- Successfully dockerized machine learning inference models for optimal resource utilization and isolation.
- Deployed models as AWS Lambda functions, enabling scalable, serverless execution with reduced operational overhead.
- **Industrial Master's Thesis**: ***"Prediction of Camera Calibration and Distortion Parameters Using Deep Learning and Synthetic Data."*** Developed a deep learning approach to predict camera calibration and distortion parameters using synthetic datasets to improve accuracy in computer vision applications.

Tampere University, Finland.
Teaching Assistant **September 2023 – November 2023**

- Worked with Professor Dr. Joni-Kristian Kämäräinen on his course "Pattern Recognition and Machine Learning" offered to students enrolled in first semester of Master's in Computer Science.
- Conducted regular weekly sessions focused on assisting students with assignments in key areas such as neural networks, decision trees, Bayesian learning, and reinforcement learning.
- Responsible for evaluating and grading student assignments, providing constructive feedback to support their learning and understanding of complex machine learning concepts.

Amplon Oy., Finland.
Machine Learning Researcher **February 2023 – October 2023**

- Developed and implemented NLP algorithms to analyze and refine business objectives in Amplon's Hoshin Kanri software, ensuring goals were clearly defined, measurable, and aligned with strategic company priorities.
- Developed and deployed a REST API using Flask on Google Cloud Run to suggest improvements for business objectives.
- Designed and implemented an AI-driven microservice to refine Key Performance Indicators (KPIs), analyzing user inputs to provide measurable and actionable recommendations.

Ladar Ltd., UK.
Machine Learning Engineer **November 2021 – August 2022**

- Explored open-source libraries, such as BlenderProc for RGB and Depth image segmentation.
- Developed a system to detect motion in live camera feed and save frames that have valuable information.
- Modified YoloV5 model to train on 5 channels: RGB + Lidar (Depth) + Infrared (IR) (this feature fusion resulted in higher precision and recall on the validation set.

- Developed a data visualization interface using Dash to display model results.
- Set up the environment to collect visual and thermal data from IP cameras installed in Oslo, Norway.

Offshore Navigation Ltd., UK.
Project Analyst **October 2020 – November 2021**

- Worked on multiple sub-projects including optimization of VoyOpt, a sail planning system and implementation and integration of APIs to obtain positional information of ships across the world.
- Provided support in devising strategies in close liaison with the Machine Learning team to improve the accuracy of weather data.

Offshore Navigation Ltd., UK.
Data Science Intern **May 2020 – August 2020**

- Performed geospatial data wrangling and analysis to extract, clean, and process location-based data for maritime applications.
- Utilized Python libraries such as Xarrays and NetCDF4 to efficiently handle large-scale multidimensional geospatial datasets, improving data processing speed and accuracy.
- Generated and analyzed heat maps of vessel positions using Marine Traffic data, providing insights into vessel movement patterns, and optimizing route planning.

National University of Computer and Emerging Sciences, Pakistan.
Teaching Assistant **January 2020 – July 2020**

- Worked with Assistant Professor Dr. Mirza Mubasher Baig on his course "Artificial Intelligence".
- Created assignments and graded quizzes for students enrolled in BSCS 6th semester.
- Conducted TA sessions to discuss and resolve course related ambiguities with students.

Educational Background

Tampere University, Finland.
Master in Computing Science **August 2022 – July 2024**

- **Specialization:** Data Science
- **GPA:** 4.77/5.00
- **Major Courses:** Statistical Methods for Text Data Analysis, Pattern Recognition and Machine Learning, Recommender Systems, Data-Driven Programming, Image and Video Processing, Statistical Inference, Bayesian Analysis
- **Thesis:** ***"Deep-BrownConrady: Prediction of Camera Calibration and Distortion Parameters Using Deep Learning and Synthetic Data."***
- Secured 100% scholarship for the entire duration of studies.

FAST National University of Computer & Emerging Sciences, Pakistan.
Bachelor of Science in Computer Science **August 2016 – June 2020**

- **GPA**: 3.52/4.00
- **Major Courses:** Data Science, Computer Vision, Deep Learning, Digital Image Pro Machine Learning, Artificial Intelligence, Information Retrieval, NLP, Data Structures, Algorithms
- **Thesis:** ***"Skin Burn Segmentation using Deep Learning."***

Publication

F. M. Chaudhry et al., "Deep-BrownConrady: Prediction of Camera Calibration and Distortion Parameters Using Deep Learning and Synthetic Data," in IEEE Transactions on Automation Science and Engineering, vol. 22, pp. 18481-18492, 2025, doi: 10.1109/TASE.2025.3588584.

Skills

Programming Languages: Advanced proficiency in C++, Python, R
Libraries: AWS, Docker, DVC, Git, Huggingface, Mlflow, Numpy, Pandas, Pytorch, Streamlit, Transformers
Technical Proficiency: Computer Vision, Deep Learning, ML, NLP, Object Detection, Segmentation