Karan Sharma

Machine Learning Engineer

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SKILLS

Programming Languages: Python, C++, SQL
Frameworks: Pytorch, TensorFlow, Django, Pandas, NumPy, OpenCV, Matplotlib, ZenML, MLflow, Slurm,
Domains: MLOps, Backend, Computer Vision, NLP, Data Analysis, REST APIs, JSON, XML, HPC, Knowledge Graph, CI/CD, SLAM
Databases and Tools: MySQL, PostgreSQL, Git, Docker, Heroku, Linux, Anaconda, Napari, Visual Studio Code, Jupyter Notebook, Label Studio, Neo4j

EXPERIENCE

Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen (GWDG) Jun 2024 – Present, Göttingen, Germany
Working Student
MLOps

- Engineered reproducible ML pipelines using ZenML and MLflow, improving experiment tracking, versioning, and output consistency across HPC environments.
- Achieved 85.58% segmentation accuracy and 207.35 TFLOPS performance by applying a 3D UNet model on the BraTS MRI dataset within a ZenML-managed workflow.
- Developed a transformer-based model for arrhythmia detection, enhancing ECG classification accuracy and supporting real-time health monitoring applications.
- Developed and utilized SLURM scripts to submit and manage jobs in the HPC environment, ensuring efficient resource utilization and job parallelization.
- Working on CI/CD workflows on HPC systems by integrating Jacamar CI with GitLab runners, enabling secure, user-isolated Slurm job submissions and streamlining ML pipeline deployments.

Histomography ***Aug 2023 – Jan 2024, Göttingen (Germany)***
Working Student
Image Processing

- Implemented advanced image processing algorithms in Python for 3D X-ray images of tissue, handling Big Data sets to extract meaningful insights and enhance scalability. Streamlined processing and visualization workflows using Napari, improving scalability and efficiency for 3D X-ray data analysis.
- Applied blob detection and segmentation techniques within medical images, contributing to Big Data-driven image analysis for comprehensive tissue characterization. Engineered the algorithm by analysing the Histogram of grayscale.
- Leveraged OpenCV and other image processing libraries like skimage and scipy in conjunction with Big Data technologies to develop and optimize algorithms, ensuring robust performance in processing large-scale 3D X-ray datasets.

LG Soft. ***May 2022 – Oct 2022, Bangalore (India)***
Software Engineer

- Developed a real-time Yoga Pose Correction feature for LG TVs, leveraging Keras for proof-of-concept and C++ for production; integrated OpenPose-based pose estimation and angle heuristics to improve user posture accuracy.
- Resolved critical WebOS media playback issues, optimizing DASH content streaming using Gstreamer; automated testing procedures via Python Selenium scripts, significantly enhancing test efficiency.
- Established the first remote SoC board testing infrastructure using Device Farm, scaling the system to manage 100 boards and streamlining embedded system validation processes.
- Mentored 2 interns and 3 new employees, ensuring high code quality, efficient knowledge transfer, and deepening their technical understanding of WebOS architecture.

LG Soft. ***Aug 2021 – Apr 2022, Bangalore, India***
Machine Learning Intern

- My focus was on automating the testing of HbbTV through the utilization of video analytics and computer vision techniques. This involvement allowed me to gain valuable experience in the application of video analytics and computer vision for testing purposes within the HbbTV domain.

- Responsible for initializing research work in the Pose Correction domain including creating datasets with web scraping and created pose classification model with around 90% accuracy.

EDUCATION

MSc. Applied Computer Science ***Oct 2022 - Present, Göttingen, Germany***
Georg-August-Universität Göttingen Grade: **1.9**

Relevant Coursework: *Machine Learning, Deep Learning for Computer Vision, Deep Learning for Natural Language Processing, Infrastructure for Data Science, Data Management for Data Science, High-Performance Data Analytics, Computer Vision and Robotics*

B.Tech. Computer Science and Engineering ***Aug 2018 – July 2022, Karnataka, India***
Indian Institute of Technology (IIT) Dharwad Grade: **8.88/10 (**German equivalent - **1.5)**

Relevant Coursework: *Data Structure and Algorithm, Data Analysis, Artificial Intelligence, Software Engineering, Database and Information System*

PROJECT

Lego Mind Storm Robot

- Designed an autonomous robot to alternate between collecting and delivering color-coded blocks, using ArUco marker detection and homogeneous transformation matrices to convert coordinates from the camera frame to robot and world frames.
- Integrated SLAM for environment mapping and PID controllers for precise motion control, enabling robust obstacle avoidance and accurate navigation in a constraint-bound arena.
- Implemented A* algorithm on a discretized world map to compute optimal paths, significantly improving task efficiency and minimizing idle time during execution.

Disease detection in Maize crop

- Used the convolution implementation of sliding window object detection on the maize leaf to detect disease and nutrient deficiency with 86% accuracy.
- Collected the dataset of Maize crops manually from the field.
- Deployment of the model on embedded devices using corresponding SOTA deep learning framework - ArmNN in Linaro, odroid xu4 and Tensor RT in Jetson nano.

Active Learning

- Labelling of text dataset using the teacher-student model of self-supervised learning.
- Automating this setup on Label Studio.

QR-based Attendance System

- Used the Python Django framework for website development with a multi-user type login system. Professors can generate QR codes for attendance of their classes while Students can scan the code using an Android app to mark their attendance.
- Deployed PostgreSQL Database on Heroku with the RDBMS principle.
- REST API is used to communicate between Android App (developed on Android studio) and Database.

LANGUAGE

ENGLISH - C1
GERMAN - A2

CERTIFICATIONS

- Deep Learning Specialization **Organization:** deeplearning.ai