ASHUTOSH SINGH

Address: Aleksis-Kivi-Str. 7, Rostock
Phone: +4917670784103
Email: ashutosh.singh.de@gmail.com
Github: @ashutoshsingh0223
Stackoverflow: @ashutosh-singh
Medium: @ashutosh.singh.de

SUMMARY

AI Research Engineer with 5+ years of experience in deep learning and machine learning, specializing in computer vision. Strong background in developing applied research for industrial applications. Currently focused on supervised and self-supervised learning in 3D Computer Vision.

WORK EXPERIENCE

Research Associate, Fraunhofer IGD **Dec 2022 - Present**

- Responsible for maintaining machine learning toolbox, to provide common utilities for data handling, ONNX exports and training pipelines for computer vision tasks.
- Transformer based 3D semantic and instance segmentation on MVS and laser scan point clouds from wheat fields.
- Self-Supervised pretraining for volume regression from point clouds of individual wheat heads.
- Unsupervised and self-supervised learning for point clouds for pretraining of 3D object detection models.
- Development and analysis of fish measurement pipeline consisting of pose estimation, inverse relative depth estimation, relative to absolute depth regression and stereo matching in multi-object scenarios.
- Fish tracking using multi-object tracking algorithms such as SORT, DeepSORT and ByteTrack.
- Image super-resolution for microscopy image.
- Instance segmentation on grayscale microscopic images using COCO pretrained models. Leveraging classes like frisbee and sports-ball as shape priors for microorganisms.
- Tools: Mlflow, Python, Numpy, Matplotlib, Pytorch, git.

Research Assistant, Fraunhofer IIS **Nov 2021 - Nov 2022**

- Studying and analysing latest developments in efficient architectures of Image Segmentation, like MobileNet, ShuffleNet, ESPNet etc. - Developed U-Net like architectures based on more efficient and sparse architectures like Depth-Wise separable and grouped convolutions.
- Master Thesis - Multimodal Signal Processing and Data Fusion methods for emotion detection on datasets like MAHNOB-HCI using end-to-end Deep Learning. Tools: weights & biases, python, numpy, matplotlib, pytorch, git.
- Tools: Weights & Biases, Python, Numpy, Matplotlib, Pytorch, Git.

Machine Learning Engineer, Jio Haptik Technologies Limited **Jan 2019 - Jan 2021**

- Developed conversational AI modules like small talk, Named Entity Recognition. Worked on Freebase data to build entity embeddings for tasks like domain classification.
- Project for paraphrase generation using variational autoencoders.
- As an attempt towards data driven development, developed a data analysis tool for bot analysts to remove bugs from the training data.
- Tools: Python, Pytorch, Numpy, matplotlib, Django, mongoDB, JIRA, Git, Amazon Web Services, Docker, docker-compose, rabbit-mq, Celery.

WORK EXPERIENCE

Data Scientist, jubi.ai **Jun 2017 - Dec 2018**

- Developed AI Assistant platform with modules like small talk, Named Entity Recognition and Intent Recognition.
- Deployed the machine learning module as a combination of five microservices on a serverless architecture.
- Microservices were containerized using Docker and deployed on AWS.
- Tools: Python, Scikit-Learn, Numpy, Matplotlib, Flask, mongoDB, git, Amazon Web Services, Docker, AWS Lambda.

EDUCATION

Bachelor of Technology - Electronics Engineering **May 2013 - June 2017**

Kamla Nehru Institute of Technology, Sultanpur

- Major in Electronics Engineering.
- Bachelor Thesis on Automatic Number Plate Recognition.

Master of Science - Computational Engineering **Nov 2020 - Nov 2022**

University of Erlangen, Erlangen

- Deep Learning, Reinforcement Learning
- Machine Learning in Signal Processing
- Image & Video Multidimensional Signal Processing, Image & Video Compression
- Algorithms in Numerical Linear Algebra
- Software Development Project

Master of Science - Computational Science **Nov 2020 - Nov 2022**

Università della Svizzera Italiana, Lugano

- Advanced Topics in ML
- Introduction to Bayesian Computing
- High Performance Computing,
- Efficient Computational Algorithms

ADDITIONAL INFORMATION

- **Technical Skills:** Computer Vision, Deep Learning, Software Development - Python, Amazon Web Service, Research Reports, Technical Reports.
- **Languages:** English, Hindi, German (Beginner).
- **Certifications:** ROS2 Beginner, Introduction to NeRFs