Sanjeev Kumar

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Professional Experience

Machine Learning Engineer — **Lyft Level 5, Self-Driving Division, Munich** — **Aug 2018 – Present**

Technologies Used: Python, C++, PyTorch, OpenCV

Semantic Map Generator

- Primary contributor and owner of the component that generates the HD semantic map required for on car perception, prediction and planning.
- Implemented geo spatial algorithms and ML pipelines to speed up the map creation with human annotators in the loop.

Traffic Light Placement

- Implemented a 3D placement algorithm for detecting and localizing traffic lights in point clouds.
- Integrated the automatic traffic light placement pipeline with Semantic Map Generator and QC tools for validation/correction by human curators. This pipeline enabled the addition of traffic light elements in HD maps.

Road Map Element Detection

- Implemented an annotation pipeline for creating ground truth datasets to extract geometries for different types of road elements (lanes, crosswalks, arrows, shark yields etc.).
- Led the implementation of semantic segmentation model training and shape extraction pipeline on the top down views created from projected camera images.
- Mentored an intern to integrate different road element models in QC tools that resulted in 25% reduction in QC time.

LiDAR Point Cloud Annotation

- Designed and implemented a 3D detector (PointRCNN) and tracker (Kalman filter-based) pipeline to pre-populate object tracks to speed up the annotation of dynamic agents (cars, pedestrians, etc.) in LiDAR point clouds.
- Worked closely with the teams in Palo Alto to integrate the tracker pipeline in the UI tool for point cloud annotation.

Machine Learning Engineer (Part-time) — **Terraloupe Gmbh** — **Aug 2016 - April 2017**

Technologies Used: Python, Keras, OpenCV

- Experimented with various deep convolutional network architectures (PSPNet, UNet etc.) for semantic segmentation of roof objects attributes (solar panel, chimney etc.) from aerial images.
- Implemented geo spatial algorithms that used segmentation output and point clouds to deliver the available roof area for installing solar panels across different German cities.

Software Engineer — **Amazon, India** — **Oct 2014 – Oct 2015**

Technologies Used: Java, RDS, DynamoDB, Herd (Workflow-orchestration Engine)

- Optimized the seller data ingestion pipeline by detecting duplicate offers in daily XML feed.
- Built a system that automatically sends notifications (SMS, email) to sellers for older offers on junglee.com and implemented the deletion workflow that could be triggered via one-click or a missed call.

Software Engineer — **Drishti Soft Solutions, India** — **June 2012 – Oct 2014**

Technologies Used: Java, JAX-RS, PostgreSQL

- Led the design and implementation of REST API for the core call center functionality (queuing calls, allocating agents etc.). Worked closely with CRM providers for integrating the API.
- Implemented a real-time monitoring system for analyzing the call volume and SLA in a call center.

Education

Munich, Germany — **Technical University of Munich** — **Oct 2015 – March 2018**

- M.Sc. in Informatics (Specialization: Computer Vision and Machine Learning)
- Inter-disciplinary Project: Cell Detection in Lens-free Microscopy Videos (published in MICCAI'17)
- Coursework: Machine Learning; Multiple View Geometry; Deep Learning; Vision Based Navigation.

Hamirpur, India — **National Institute of Technology** — **July 2008 – May 2012**

- B.Tech. in Computer Science and Engineering
- Coursework: Object Oriented Programming; Data Structure and Algorithms; Theory of Computation; Operating System.

Technical Skills

- Programming Languages: Python (Advanced), C++ (Intermediate), Java (Intermediate).
- ML/CV Toolkits: Tensorflow, PyTorch, Keras, OpenCV, ROS, SciPy.
- Others: Git, Linux, Docker, Amazon Web Services, QGIS, Flask, REST.