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Ajay Unagar

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EDUCATION

ETH Zurich, Switzerland Sep 2019 - Ongoing
MSc in Computational Science (Specialization: Robotics) Transcript
Courses: Computer Vision, 3D Vision, Machine Learning, Deep Learning for Autonomous Driving

IIT Roorkee, India July 2013 - May 2017
BSc in Civil Engineering (Minor in Computer Science and Engineering) Transcript
Courses: Data Structures, Algorithms, Database Systems, Numerical Methods, Probability and Statistics

RELEVANT PROFESSIONAL EXPERIENCE

Research Assistant at Intelligent Maintenance Systems Lab, ETH Zurich May 2020 - Ongoing

- Working on calibration of engineering systems (e.g. Batteries) using deep Reinforcement Learning
- Designed Actor-Critic based RL algorithm with lyapunov constraint for stable tracking of the system parameters

Masters Student at IBM Research, Zurich, Switzerland June 2020 - Dec 2020

- Worked on Continual Learning (CIL) problem for Image Classification based on Deep Neural Networks (DNN)
- Implemented data-distillation based regularization method to reduce *forgetting* in DNNs in medical images

Data Scientist at ZS Associates, Pune, India Jul 2017 - Jul 2019

Marketing Sequence Optimization for Customer Centric Marketing (Python, Spark)

- Combined Machine Learning (Convolutional Neural Network) and Optimization (Genetic Algorithms) techniques to design optimal marketing sequence maximizing the sales-response from the physicians
- Integrated the algorithm with with the existing sytems using PySpark accelerator for real-time suggestions

PUBLICATIONS

- Ajaykumar Unagar, Yuan Tian, Mauel Arias Chao, Olga Fink [paper & talk]
  "Battery Model Calibration with Deep Reinforcement Learning" *NeurIPS 2020 Workshop*
- Ajaykumar Unagar*, Philipp Lindenberger*, Nikolaos Tselepidis*, PE Sarlin [paper & talk]
  "6-DoF Camera Pose Refinement using Feature-Metric Optimization" *CVPR 2020 Workshop*

RELEVANT PROJECTS

Deep-direct visual localization using learned feature optimization (PyTorch) Feb 2020 - Nov 2020

- Working on direct visual localization using learned invariant features from Deep Neural Network
- Using unrolled LM optimizer end-to-end training of the features from GT pose and reference sfm model
- Published initial version at CVPR 2020 Workshop on VisLocOdom and submitted full version to CVPR 2021

Multi-Task Learning framework for Autonomous Driving (PyTorch) Feb 2020 - June 2020

- Designed multi-task network for *semantic segmentation* and *depth estimation* of natural scenes
- Used task-distillation network with Encoder-Decoder structure to achieve balance accuracy on both tasks

Robotic Control using Computational Methods (C++) Feb 2020 - June 2020

- Designed a Open-Loop Controller for Six-Legged robots using Inverse Kinematics
- Implemented different gaits for Robotic movements and the goal following trajectory optimization algorithm

Parallel Algorithms for Subgraph Isomorphism (C++, OpenMP, MPI) Sept 2019 - Jan 2020

- Implemented parallel version of exact Graph Matching algorithms VF2 and Glasgow in C++
- Different parts of the algorithms are further optimized for multi-threaded systems using OpenMP task parallelization as well as MPI process sharing

TECHNICAL SKILLS

	Programming	Tools
Experienced	Python, C++	PyTorch, Sklearn, MLflow, Git, OpenCV, OpenMP
Intermediate	C, SQL, R	Tensorflow, Spark, Matlab, MPI