Tejaswi Kasarla

Research Interests

Domains

- Deep Learning
- Computer Vision
- Machine Learning

Sub-Domains

- Active Learning
- 2D, 3D Scene Understanding
- Self-Supervised Learning
- Temporal Representations
- Action and Intent Understanding

Skills

- **Languages**: Python, C++, Bash, HTML, MATLAB
- **ML Frameworks**: PyTorch, Caffe, Keras, Tensorflow
- **Others**: OpenCV, SciPy Scikit-learn, p5js

Certifications

Oxford Machine Learning Summer School (OxML), 2021

IPAM Workshops on Mathematical Challenges and Opportunities for Autonomous Vehicles, 2020

Summer School of Machine Learning at Skoltech, 2020

Summer School on Deep Learning for Computer Vision, IIIT-Hyderabad, 2016

Design Innovation Workshop, MIT Media Lab India Initiative, 2015

EDUCATION

Ph.D. in Computer Science — Starting Oct 2021
University of Amsterdam
Advisors: *Pascal Mettes, Rita Cucchiara*

M.S. (by Research) in Computer Science — Aug 2019
International Institute of Information Technology, Hyderabad — *Grade: 7.17/10*
Advisors: *Prof. C.V Jawahar, Dr. Vineeth N. Balasubramanian*

B.Tech in Electrical and Electronics Engineering — May 2015
Mahatma Gandhi Institute of Technology, JNTU Hyderabad — *Grade: 80.48%*

THESIS AND PUBLICATIONS

[1] **MS Thesis:** Efficient Annotation and Knowledge Distillation for Semantic Segmentation, *International Institute of Information Technology, Hyderabad, 2019.* [link]

[2] **Tejaswi Kasarla,** G Nagendar, Guruprasad Hegde, Vineeth N. Balasubramanian, C.V. Jawahar, "Region-Based Active Learning for Efficient Labelling in Semantic Segmentation", *IEEE Winter Conference on Applications of Computer Vision (WACV) 2019.* [paper] [poster]

RESEARCH EXPERIENCE

Computer Vision Researcher, Robert Bosch — May 2019-Aug 2021

- **Multi-sensor Data Annotation:** The projects aims to develop a novel annotation system for multi-modal data (LiDAR, RADAR and images) with tools for efficient, accurate 3D annotation of objects and their tracking. I implemented object detection and tracking algorithms for integration into the pipeline to facilitate easier annotation of new data. I currently lead the research on data augmentation techniques for LiDAR.
- **Image Attribute Understanding:** This research aims to retrieve fine-grained image attributes for pedestrians in an image. I implemented and tested a novel deep feature representation that outperforms CNN features and improves the top-20 retrieval by a large margin.
- **Ego-vehicle event detection:** This project aims to build a search and retrieval tool that leverages CAN-Bus data available from a drive sequence to identify video events related to ego-vehicle navigation. I implemented the data ingestion pipeline for video sequences and parallelized it to efficiently run for 100,000 sequences.

Research Intern, Robert Bosch — Jun 2018-Oct 2018

- **Knowledge Distillation for Semantic Segmentation:** Proposed a method to improve the performance of real-time semantic segmentation models using knowledge distillation. Implemented and tested the method across several semantic segmentation architectures (ICNet, ENet, MobileNet). The validation IoU of these fast-segmentation networks improves by 3-4% with no additional computation during inference.

Graduate Research Assistant, CVIT, IIIT Hyderabad — Aug 2016-Mar 2019

- **Active Learning for Semantic Segmentation:** Proposed multiple pixel-wise and superpixel-wise uncertainty estimation strategies for semantic segmentation inference. These uncertain pixels are queried for true labels through an active learning framework with ICNet as base model. Performed extensive experiments of the proposed strategies on unlabeled Cityscapes and Mapillary datasets. By querying true labels for only 10% of superpixels, the methods achieve performance comparable to fully supervised training. Published paper as first-author to WACV 2019.
- **Intelligent Image Matching:** Created a dataset from of the screenshots of 3D CAD models sent by Altair Engineering India Pvt. Ltd. Proposed an intelligent image matching and registration algorithm to find the errors and differences in the images.

References

Dr. Amit Arvind Kale
Principal Senior Expert and Group Leader
Bosch, India

Prof. C.V. Jawahar
Amazon Chair Professor & Dean (Research and Development)
IIIT-Hyderabad

Dr. Vineeth Balasubramanian
Associate Professor
IIT Hyderabad

Research Fellow, LVPEI Center for Innovation — Aug 2015-Jan 2016

- **Pediatric Perimeter:** Pediatric Perimeter is novel device that quantfies visual field extent (VFE) for infants. The device is a hemispherical dome with light emitting diodes (LEDs) controlled using a computer program to measure Reaction Time (RT) and the VFE. As a part of the project, I built a cross-platform software for the testing procedure that integrates LED control with Arduino. Implemented and tested algorithms for eye and head tracking of the infant in the software and recorded the readings of the experiment.

SCIENTIFIC OUTREACH

General Chair: Women in Computer Vision Workshop (WiCV), CVPR 2021
Organizer: Whiteboard Talks, Robert Bosch. A bi-weekly talk series discussing research, engineering and other ongoing topics at Corporate Research, Robert Bosch, India (ongoing)
Reviewer: Women in Machine Learning Workshop (WiML),NeurIPS 2019
Volunteer: ICLR 2020, ICML 2020, NeurIPS 2020, ICVGIP 2018
Talks:

- *Active Learning for Semantic Segmentation*, SMILES summer school, 2020
- *Active Learning for Semantic Segmentation*, First Research Symposium, IIIT Hyderabad, 2017