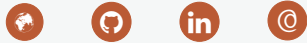


# Tejaswi Kasarla



## Research Interests

### Domains

- > Deep Learning
- > Computer Vision
- > Machine Learning

### Sub-Domains

- > Video Understanding
- > 2D, 3D Scene Understanding
- > Self-Supervised Learning
- > Active Learning
- > 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

University of Amsterdam

Oct 2021-present

**Advisors:** Pascal Mettes, Rita Cucchiara

### M.S. (by Research) in Computer Science

International Institute of Information Technology, Hyderabad

Aug 2019

Grade: 7.17/10

**Advisors:** Prof. C.V Jawahar, Dr. Vineeth N. Balasubramanian

### B.Tech in Electrical and Electronics Engineering

Mahatma Gandhi Institute of Technology, JNTU Hyderabad

May 2015

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 project 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 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

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### Dr. Pascal Mettes

Assistant Professor  
*University of Amsterdam*

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### Dr. Amit Arvind Kale

Principal Senior Expert and  
Group Leader  
*Bosch, India*

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### Prof. C.V. Jawahar

Amazon Chair Professor & Dean  
(Research and Development)  
*IIIT-Hyderabad*

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### Dr. Vineeth Balasubramanian

Associate Professor  
*IIT Hyderabad*

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## Research Fellow, LVPEI Center for Innovation

Aug 2015-Jan 2016

- **Pediatric Perimeter:** *Pediatric Perimeter* is novel device that quantifies 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.
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## SCIENTIFIC OUTREACH

**General Chair:** Women in Computer Vision Workshop (*WiCV*), CVPR 2021 and 2022

**Organizer:** Whiteboard Talks, Robert Bosch. A bi-weekly talk series discussing research, engineering and other ongoing topics at Corporate Research, Robert Bosch, India

**Reviewer:** Women in Machine Learning Workshop (*WiML*) at 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
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