Tejaswi Kasarla

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Research Interests

Domains

- Machine Learning
- Deep Learning
- Computer Vision

Sub-Domains

- Active Learning
- Scene Understanding
- Autonomous Driving
- Neural Model Compression

Courses

Graduate

- Digital Image Processing
- Statistical Methods in Artificial Intelligence
- Introduction to Parallel Scienticfic Computing
- Computer Vision
- Optimization Methods
- Topics in Machine Learning

Skills

- **Languages**: Python, C, Bash, HTML, CSS, MATLAB
- **ML Frameworks**: PyTorch, Caffe, Keras (Basic)
- **Others**: OpenCV, SciPy Scikit-learn, LaTeX

Positions Held

Contributor & DRI, *2017-18*
Stanford Scholar Initiative

Member, *2017-18*
LeanIn, IIIT Hyderabad

Education

MS (by Research) in Computer Science August 2016 - Present
International Institute of Information Technology, Hyderabad *CGPA: 7.17/10*

MS Thesis: Efficient Annotation and Knowledge Distillation for Semantic Segmentation.

My thesis focuses on developing efficient deep learning based methods to reduce data and computational constraints, with an aim to deploy the systems on self-driving cars.

B.Tech in Electrical and Electronics Engineering 2011 - 2015
Mahatma Gandhi Institute of Technology, JNTU Hyderabad *CGPA: 80.48%*

Publications

[1] **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.*

Work Experience

Graduate Research Assistant, CVIT, IIIT-H Aug 2016-Jan 2019
Research work at the intersection of computer vision and deep learning. Worked on developing various active learning methods to intelligently annotate datasets for semantic segmentation in the domain of Computer Vision. Published a paper in WACV 2019 as part of the assistantship.

Research Intern, Research and Technology Centre, Bosch India Jun 2018-Oct 2018
Worked on data analysis and visualization of multi-object tracking metrics. Worked on improving the performance of deep neural networks for semantic segmentation architectures using knowledge distillation.

Research Intern,CVIT, IIIT-H Mar 2016-June 2016
Spent time during my internship to explore and implement the algorithms related to scene text recognition. Also volunteered and attended Summer School on Deep Learning for Computer Vision at IIITH to explore the field before joining Masters program.

Research Fellow, LVPEI Centre for Innovation Aug 2015-Jan 2016
Joined LVPEI Center for Innovation after my Bachelors' to explore the field of Medical Image Processing and Computer Vision. Worked on an ongoing project to quantify the visual field in infants and was responsible for creating a cross-platform application for conducting the experiment

Research Projects

Knowledge Distillation for Semantic Segmentation, Bosch India Jun 2018-Dec 2018
Dr. Guruprasad Hegde, Prof. C.V. Jawahar

- Project to improve the performance of fast-segmentation networks such as icnet, enet, MobileNet.
- Developed ensemble based knowledge distillation method to train in teacher-student setting.
- Able to improve the validation performance of fast-segmentation networks by 3-4% by teacher ensemble supervision. The inference time during testing remains unchanged.

Active Learning for Semantic Segmentation, IIIT Hyderabad Jan 2017-Jun 2018
Prof. C.V. Jawahar, Dr. Vineeth N. Balasubramaninan

- Developed extensive semi-supervised active learning algorithms for intelligently selecting data-points for annotation.
- This facilitates to achieve $\sim$ 90-95% performance of fully supervised method without the need for annotating the whole dataset.
- Research based on the work accepted to WACV 2019.

Content Writer, *2017*
TEDxHyderabad

Organizing Team, *2016*
Summer School on Deep Learning for Computer Vision

Team Lead, *2015*
MIT Media Lab India Initiative

Achievements

Third Winner, Atmel Embedded Design Contest, 2015 : for efficient dual-axis solar tracker

References

Prof. C.V. Jawahar
IIIT-Hyderabad

Dr. Vineeth Balasubramanian
IIT Hyderabad

Dr. Guruprasad Hegde
Bosch India

Intelligent Image Matching, IIIT Hyderabad — Monsoon '16
Prof. C.V. Jawahar, Dr. Anand Mishra

- Developed an intelligent image matching and registration algorithm to find the errors and differences in 3D CAD models in 2D space.
- Formulated a dataset of the images sent by Altair Engineering India Pvt. Ltd.

Unsupervised Sketch Simplification for SBIR, IIIT Hyderabad — Monsoon '16
Dr. Vineeth Gandhi

- Developed an unsupervised method of sketch simplification to retrieve images from sketch input my humans.
- Formulated a function based on Fourier descriptors for simplification of sketch drawn by humans.
- Trained an auto-encoder network on TU-BERLIN dataset and used the bottle-neck representation to show sketch based image retrieval (SBIR) on Caltech-256 dataset.

Pediatric Perimeter, LVPEI Center for Innovation — Aug 2015-Jan 2016
Dr. Premnandini Satgunam, Dhruv Joshi

- Worked on the ongoing Pediatric Perimeter project, a novel device which is used to quantify visual field in infants through video-based gaze estimation.
- Developed a cross-platform software to test and record the results of the experiment on infants.
- Implemented the analysis of the data obtained to quantify the visual fields and reaction time using a visual fiducial system algorithm based on near-optimal lexicographic coding system (AprilTags).

Select ML Projects

Multi-class Cost Effective Active Learning — Aug '18
Implemented CEAL paper for medical image segmentation and extended it to multi-class segmentation obtaining 56.0 IoU on Cityscapes dataset.

Deep Retinal Image Understanding — Mar '18
Implemented the deep retinal image understanding paper on a dataset obtain from LVPEI Center for Innovation.

Constrained Policy Optimization — Monsoon '17
Implemented the constrained policy optimization paper for Topics in Machine Learning course project

Supervised Learning of Gaussian Mixture Models for Visual Vocabulary Generation — Monsoon '16
Implemented a Gaussian mixture model for k-means to create a visual vocabulary dictionary for Caltech - 101 dataset for Statistical Methods in AI course project.

Conferences, Schools and Hackathons

- Presented my work on *Active Learning for Semantic Segmentation* at 1^{st} Research Symposium at IIIT-H.
- Completed the Summer School on Deep Learning for Computer Vision held at IIIT-H.
- Attended the ReDX Hackathon 2015 for Health Care Innovation and prototyped a low-cost device for fundus imaging.
- Attended the MIT Media Lab India Initiative 2015 and worked on an IoT project for Welspun textiles.