Siva Karthik Mustikovela

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EDUCATION **Ph.D Student** (3^{rd} year) *(September 2016 - Present)*
Prof. Carsten Rother, Prof. Andreas Geiger (Co-Supervisor, MPI, Tubingen)
Visual Learning Lab, Heidelberg University, Germany

Integrated Dual Degree (Bachelor of Tech. + Masters in Robotics) *(Aug 2009 - June 2015)*
International Institute of Information Technology(IIIT-H), Hyderabad, India
Masters : Robotics Research Centre, advised by Prof. K Madhava Krishna.
Thesis : Searching for small objects in indoor environments over mobile robots.

INTERESTS Machine learning for realistic training data generation, domain adaptation
general scene understanding (scene flow estimation, object pose estimation)

PUBLICATIONS LINKS INCLUDED **Bounding Boxes, Segmentations and Object Coordinates: How Important is Recognition for 3D Scene Flow Estimation in Autonomous Driving Scenarios?**
ICCV 2017
Siva Karthik M*, Aseem Behl*, Omid Hosseini Jafari*, Hassan Abu Alhaija, Carsten Rother, Andreas Geiger (*Equal Contribution)

iPose: Instance-Aware 6D Pose Estimation of Partly Occluded Objects
ACCV 2018
Siva Karthik M*, O. H. Jafari*, K. Pertsch, E. Brachmann, Carsten Rother (*Equal Contribution)

Geometric Image Synthesis
ACCV 2018
H Abu Alhaija, **Siva Karthik M**, Andreas Geiger, Carsten Rother

Augmented Reality Meets Computer Vision : Efficient Data Generation for Urban Driving Scenes,
IJCV 2018
H Abu Alhaija, **Siva Karthik M**, L. Mescheder, Andreas Geiger, Carsten Rother

Augmented Reality Meets Deep Learning for Car Instance Segmentation in Urban Scenes
BMVC 2017
H Abu Alhaija, **Siva Karthik M**, Lars Mescheder, Andreas Geiger, Carsten Rother

Can Ground Truth Label Propagation from Video help Semantic Segmentation?
ECCV 2016 *(Workshop on Video Segmentation)* [Link]
M Siva Karthik, Michael Yang, Carsten Rother

During Masters :

Guess from Far, Recognize when Near: Searching the Floor for Small Objects
ICVGIP 2014, *Indian Conf. on Vision Graphics and Image Processing*
M Siva Karthik, S. Mittal, K Madhava Krishna

Markov Random Field based Small Obstacle Discovery over Images
ICRA 2014, *International Conf. on Robotics and Automation*
S. Kumar, **M Siva Karthik**, K Madhava Krishna

Small Object Discovery and Recognition using Actively Guided Robot
ICPR 2014, *International Conf. on Pattern Recognition*
M Siva Karthik, S. Mittal, K Madhava Krishna

Research Experience

Computer Vision Lab, TU-Dresden, Germany
Intern (Advisor - Prof. Carsten Rother)

- Project involves the development of algorithms for Semisupervised Learning of Convolutional Neural Networks for scene understanding using augmented data.
- Demonstrated improvement in performance of semantic segmentation networks using augmented data obtained from label propagation in videos. (Paper attached above, ECCVW, 2016)

Robotics Research Centre, IIIT-H, India
Research Assistant (Guide - Prof. K Madhava Krishna)
Project involves development of a mobile robot system that can efficiently search for small objects in large indoor scenes.

- Devised an approach to discover small objects on floor through a Markov Random Field over a homography model and probabilistically infer about existence of a query object from far.
- Proposed a new polar data structure-Viewpoint Object Potential, that encapsulates the best set of discriminative viewpoints to efficiently recognize a 3-D point cloud of an object.
- Further, developed a Decision Analysis based search strategy to actively navigate through the environment and maximize the reward earned.

Frueh and Partner-Personal Robotics AG, Zurich, Switzerland
Graduate Research Intern (Guide - Dr. Hansruedi Frueh)
Responsible for developing a Deep Learning based Face Recognition application and an object recognition and tracking platform to be ported onto their home built robot-PRob.

- Incorporated a Deep Belief Network to train and classify facial representation points.
- Implemented a 3-D object recognition and tracking platform.

Siemens AG - Corporate Research Centre, Bangalore, India
Summer Research Intern (Guide - Pradeep Gopalakrishnan)
Fetal Heart Sound Monitor(FHSM) data classification using Spiking Neural Nets(SNNs).

- Analysed FHSM data for preliminary noise modelling and removal for extraction of a signal with high SNR. Further analysed it for various discriminative frequency characteristics among classes.
- Classified FHSM data using SNNs by transforming it to a higher dimensional temporal space using Receptive Field Encoding.

ARL, National University of Singapore
Summer Research Intern (Guides -Dr. Mandar Chitre, Koay Teong Beng)
Scalable long range AUV position estimation and RF communication platform. Used C++, Java, Arduino, Android ADK, Google Maps API.

- Integrated an RF communication framework into AUV software platform to broadcast AUV position to deployment boats and ground stations.
- Estimated the position of AUVs in case of communication failure using Kalman Filter and already existing data like current flow, speed etc. Visualized all of this on Maps API on tablet devices.

Professional Services

Reviewer for CVPR-19, ECCV-18, GCPR-18, CVPR-16, ECCV-16, ICRA-15

Academic Achievements

- Ranked in top 0.8% among 1 million participants in All India Engineering Examination-2009.
- Ranked 13th among Ten Thousand participants in National KVS Mathematics Olympiad 2005-06, organized by Kendriya Vidyalaya Sangathan, India.
- Ranked 22nd at the National Mathematics Olympiad Training Camp, Group Mathematics Olympiad 2007 organized by National Board of Higher Mathematics.

Technical Skills

- Languages : C++, Python, Matlab
- Operating Systems : Unix/Linux, Windows
- Libraries : PyTorch, Tensorflow, Caffe, OpenCV

References

- Prof. Carsten Rother (carsten.rother@iwr.uni-heidelberg.de) - Visual Learning Lab, Heidelberg University, Germany
- Prof. Andreas Geiger (andreas.geiger@tuebingen.mpg.de) - Max Plank Institute, Tubingen, Germany
- Prof. K Madhava Krishna(mkrishna@iiit.ac.in) - Robotics Research Centre, IIIT-H, India