Siva Karthik Mustikovela

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EDUCATION

Heidelberg University, Germany *(September 2016 - May 2021)*
Ph.D in Computer Vision
Advisor: Prof. Carsten Rother
Topic: Solving Computer Vision Problems through Self-Supervision and Generative Image Synthesis

International Institute of Information Technology(IIIT-H), India *(Aug 2009 - June 2015)*
Integrated Dual Degree (Bachelor of Tech. + Masters in Robotics)
Advisor: Prof. K Madhava Krishna

INTERESTS

Self-supervised learning, controllable generative models, synthetic data and vision-language models

WORK EXPERIENCE

Cruise - GM *(Oct 2022 - Present)*
Senior Research Scientist

Generative Models & Synthetic data:
- Developed a controllable video generation framework for end-to-end synthetic driving scenario simulation.
- Enabled scalable training on large datasets using distributed compute infrastructure.
- Showcased controllable synthetic scenario generation capabilities leading to adoption across teams.

Foundation Models:
- Benchmarked visual foundation models for 3D video understanding in autonomous driving data.
- Consolidated models across multiple tasks, improving average performance by 17% with 30% less data.

Mapless Driving:
- Developed a long-range onboard map prediction framework in collaboration with the office of CTO.
- Reduced reliance on expensive High Definition maps and helped unlock new operating domains.

Mentoring:
- Mentored masters students and PhD interns leading to publications in ICCV-Workshop '23, CVPR '24

Algolux - Torc *(Nov 2021 - Sep 2022)*
Research Scientist
- Developed generative model based synthetic data for long-range and diverse-weather depth prediction.
- Built regularization methods for adverse-weather depth prediction through historic driving priors.
- Improved long-range diverse weather depth-prediction by 14%

NVIDIA Research (Learning and Perception Research) *(June 2020 - Mar 2021)*
PhD Research Intern | Hosts: Shalini De Mello, Jan Kautz
Published research on self-supervised learning of object detection through generative modeling (ICCV 21)

NVIDIA Research (Learning and Perception Research) *(Apr 2019 - Nov 2019)*
PhD Research Intern | Hosts: Varun Jampani, Shalini De Mello, Jan Kautz
Published research on self-supervised viewpoint learning through generative modeling (CVPR 20)

Siemens Research (Machine Learning Research) *(April 2013 - June 2013)*
Research Intern

National University of Singapore (Acoustics Research Lab) *(April 2012 - June 2012)*
Summer Intern

F&P Robotics, Zurich (Computer Vision Group) *(April 2013 - June 2017)*
Research Consultant

PUBLICATIONS

ViP-LLaVA: Making Large Multimodal Models Understand Arbitrary Visual Prompts
CVPR 2024
M. Cai, H. Liu, D. Park, **S. K. Mustikovela**, G. P. Meyer, Y. Chai, Y. J. Lee

VLMine: Long-Tail Data Mining with Vision Language Models
WACV 2025
M. Ye, G. P. Meyer, Z. Zhang, D. Park, **S. K. Mustikovela**, Y. Chai, E. M. Wolff

VLM-AD: End-to-End Autonomous Driving through Vision-Language Model Supervision
Under Review, Arxiv 2024
Y. Xu, Y. Hu, Z. Zhang, G. P. Meyer, **S. K. Mustikovela**, S. Srinivasa, E. M. Wolff, X. Huang

NOVA: NOvel View Augmentation for Neural Composition of Dynamic Objects
ICCV CV4Metaverse Workshop 2023
D. Agrawal, J. Xu, **S. K. Mustikovela**, I. Gkioulekas, A. Shrivastava, Y. Chai

Self-Supervised Object Detection via Generative Image Synthesis
ICCV 2021
S. K. Mustikovela, S. D. Mello, A. Prakash, U. Iqbal, S. Liu, T. Nguyen-Phuoc, C. Rother, J. Kautz

Self-Supervised Viewpoint Learning Using Image Collections
CVPR 2020
S.K. Mustikovela, V. Jampani, S. D. Mello, S. Liu, U. Iqbal, C. Rother, J. Kautz

Intrinsic Autoencoders for Deferred Neural Rendering and Intrinsic Image Decomposition
3DV 2020
S. K. Mustikovela*, H. Abu Alhaija*, J. Thies, V. Jampani, M. Niessner, A. Geiger, C. Rother

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

Bounding Boxes, Segmentations and Object Coordinates: How Important is Recognition for 3D Scene Flow Estimation in Autonomous Driving Scenarios?
ICCV 2017
S. K. Mustikovela*, A. Behl*, O. H. Jafari*, H. Abu Alhaija, C. Rother, A. Geiger
(*Equal Contribution)

Geometric Image Synthesis
ACCV 2018
H. Abu Alhaija, **S. K. Mustikovela**, A. Geiger, C. Rother

Augmented Reality Meets Computer Vision : Efficient Data Generation for Urban Driving Scenes
IJCV 2018
H. Abu Alhaija, **S. K. Mustikovela**, L. Mescheder, A. Geiger, C. Rother

Augmented Reality Meets Deep Learning for Car Instance Segmentation in Urban Scenes
BMVC 2017
H. Abu Alhaija, **S. K. Mustikovela**, L. Mescheder, A. Geiger, C. Rother

Can Ground Truth Label Propagation from Video help Semantic Segmentation?
ECCV 2016 *(Workshop on Video Segmentation)* [Link]
S. K. Mustikovela, M. Yang, C. Rother

A Hierarchical Network for Diverse Trajectory Proposals
Intelligent Vehicles 2019
S. Narayanan, G. Kumar, A. Singh, **S. K. Mustikovela**, S. Saurav, B. Bhowmik, M. Krishna

During Masters :

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

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

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

Patents

Training and inferencing using a neural network to predict orientations of objects in images
S.K. Mustikovela, V. Jampani, S. D. Mello, S. Liu, U. Iqbal, C. Rother, J. Kautz

Method and a system for hierarchical network based diverse trajectory proposal
B. Bhowmick, M. Krishna, S. Narayanan, G. Kumar, A. Singh, **S. K. Mustikovela**, S. Saurav

Skills

- Python, PyTorch, Tensorflow
- Computer Vision, Deep Learning, Diffusion Models, Generative Adversarial Networks

Services

- Reviewer for the following top Computer Vision, Machine Learning, AI conferences:
  CVPR, ICCV, ECCV, ICLR, BMVC, ACCV

Awards

- Ranked in top 0.8% among 1 million participants in All India Engineering Examination-2009.
- Ranked 13th among Ten Thousand participants in National Mathematics Olympiad 2005-06, India.
- Ranked 22nd at the National Mathematics Olympiad 2007, India.

References

- Dr. David Hayden (david@dshayden.com) - Cruise, San Francisco, USA
- Dr. Eric Wolff - Cruise, San Francisco, USA
- Dr. Greg meyer (gregorpm@gmail.com) - Meta, Pittsburgh, USA
- Dr. Yuning Chai - Meta, Seattle, USA
- Dr. Shalini De Mello (shalinig@nvidia.com) - NVIDIA Research, Santa Clara, USA
- Dr. Varun Jampani (varunjampani@gmail.com) - Google Research, Cambridge, USA
- Prof. Carsten Rother (carsten.rother@iwr.uni-heidelberg.de) - Heidelberg University, Germany