

EDUCATION

International Max Planck Research School for Intelligent Systems (IMPRS-IS)	Oct 2021-June 2025 (Expected)
Ph.D in Computer Science	
International Institute of Information Technology, Hyderabad	2016-2021
B.Tech. (Honors) + M.S. by Research in Computer Science and Engineering	Cumulative GPA: 8.44/10 MS Thesis

WORK EXPERIENCE

Research Intern — Snap Research	April '24 - August '24
Technologies: <i>Python, LLMs, Generative Models, Tex-to-Image Generation, Preference Optimization</i>	
<ul style="list-style-type: none">Worked with Dr. Jian Ren and Dr. Anil Kag in the Creative Vision group at Snap Research.Improved text-to-image models (e.g. SDXL, SD3) by over 10% on quantitative benchmarks using Direct Preference Optimization.Work on novel preference objective and optimization strategy led to a publication and patent filing.	
PhD Candidate — University of Tübingen	Oct '21 - Present
Technologies: <i>PyTorch, Deep Learning, Diffusion Models, Multimodal LLMs, Inference-time Scaling</i>	
<ul style="list-style-type: none">Work with Prof. Zeynep Akata and Dr. Massimiliano Mancini in the Explainable Machine Learning group.Work focuses on enhancing compositionality of vision-language models in various multimodal settings.	
Research Intern — NAVER LABS Europe	Jan '21 - Jul '21
Technologies: <i>Python, Deep Learning, Computer Vision, Optimization Methods, Self-Supervised Learning</i>	
<ul style="list-style-type: none">Worked with Dr. Boris Chidlovskii and Dr. Jerome Revaud in the 3D vision group at NAVER LABS Europe.Work on self-supervised methods for learning from noisy labels in class-imbalanced settings led to a publication and a patent filing.	
Research Assistant — Center for Visual Information Technology, IIIT-Hyderabad	May '18 - Dec '20
Technologies: <i>Deep Learning, Computer Vision, Optimization Methods, Python, Matlab, PyTorch, OpenCV, ffmpeg</i>	
<ul style="list-style-type: none">Worked broadly on developing various pipelines related to accurately tracking objects in videos.Worked on on Hierarchy-Aware Classification leading to a publication at ICLR 2021.Proposed an unsupervised algorithm for person re-identification in videos and used it to obtain state-of-the-art results on the popular Multi-Object Tracking benchmarks.Developed novel analyses to highlight and understand the failure cases and limitations of various single-object tracking models.	
Software Development Intern — Hewlett Packard Enterprise	May '17 - Jul '17
Technologies: <i>node.js, Angular.js, Bash Scripting</i>	
<ul style="list-style-type: none">Worked on an internal tool to monitor and test security vulnerabilities on servers.	

PUBLICATIONS

Scalable Ranked Preference Optimization for Text-to-Image Generation	<i>Arxiv</i>
Shyamgopal Karthik, Huseyin Coskun, Zeynep Akata, Sergey Tulyakov, Jian Ren, Anil Kag	Paper Project Page
ReNO: Enhancing One-step Text-to-Image Models through Reward-based Noise Optimization	<i>NeurIPS 2024</i>
Luca Eyring*, Shyamgopal Karthik*, Karsten Roth, Alexey Dosovitskiy, Zeynep Akata	Paper Code
EgoCVR: An Egocentric Benchmark for Fine-Grained Composed Video Retrieval	<i>ECCV 2024</i>
Thomas Hummel*, Shyamgopal Karthik*, Mariana-Iuliana Georgescu, Zeynep Akata	Paper Code
Vision-by-Language for Training-Free Compositional Image Retrieval	<i>ICLR 2024</i>
Shyamgopal Karthik*, Karsten Roth*, Massimiliano Mancini, Zeynep Akata	Paper Code
If at First You Don't Succeed, Try, Try Again:	
Faithful Diffusion-based Text-to-Image Generation by Selection	<i>ICCV-W 2023</i>
Shyamgopal Karthik*, Karsten Roth*, Massimiliano Mancini, Zeynep Akata	Paper Code
Test-Time Amendment with a Coarse Classifier for Fine-Grained Classification	<i>NeurIPS 2023</i>
Kanishk Jain, Shyamgopal Karthik, Vineet Gandhi	Paper Code
BayesCap: Bayesian Identity Cap for Calibrated Uncertainty in Frozen Neural Networks	<i>ECCV 2022</i>
Uddeshya Upadhyay*, Shyamgopal Karthik*, Yanbei Chen, Massimiliano Mancini, Zeynep Akata	Paper Code
KG-SP: Knowledge Guidied Simple Primitives for Open World Compositional Zero-Shot Learning	<i>CVPR 2022</i>
Shyamgopal Karthik, Massimiliano Mancini, Zeynep Akata	Paper Code
Revisiting Visual Product for Compositional Zero-Shot Learning	<i>NeurIPS-W 2021</i>
Shyamgopal Karthik, Massimiliano Mancini, Zeynep Akata	Paper Code

No Cost Likelihood Manipulation at Test Time for Making Better Mistakes in Deep Networks
Shyamgopal Karthik, Ameya Prabhu, Puneet K. Dokania, Vineet Gandhi

ICLR 2021
[Paper](#) | [Code](#)

Learning from Long-Tailed Data with Noisy Labels
Shyamgopal Karthik, Jerome Revaud, Boris Chidlovskii

ICCV-W 2021
[Paper](#) | [Slides](#)

Simple Unsupervised Multi-Object Tracking
Shyamgopal Karthik, Ameya Prabhu, Vineet Gandhi

Arxiv
[Paper](#)

ViNet: Pushing the limits of Visual Modality for Audio-Visual Saliency Prediction
Samyak Jain, Pradeep Yarlagadda, Shreyank Jyoti, *Shyamgopal Karthik* , Ramanathan Subramanian, Vineet Gandhi

IROS 2021
[Paper](#) | [Code](#)

Exploring 3 R's of Long-term Tracking: Re-detection, Recovery and Reliability
Shyamgopal Karthik, Abhinav Moudgil, Vineet Gandhi

WACV 2020
[Paper](#) | [Slides](#)

RELEVANT TEACHING EXPERIENCE

Statistical Methods in AI — Teaching Assistant, IIIT-Hyderabad · Handled assignment setting and evaluations for the course.	Jan '20 - May '20
Computer Programming — Teaching Assistant, IIIT-Hyderabad · Handled assignment and examination evaluations, and examination invigilation for the course. · Took weekly labs explaining various concepts of C programming language and clarifying doubts.	Aug '19 - Dec '19
Discrete Structures — Teaching Assistant, IIIT-Hyderabad · Handled regular tutorial sessions, problem settings, and examination evaluations for the course.	Aug '18 - Dec '18

MACHINE LEARNING AND COMPUTER VISION PROJECTS

Min-Cost Flow Networks for Multi-Object Tracking <i>Technologies: Python, networkx, tensorflow</i> · Implemented a min cost flow network model within the tracking-by-detection paradigm to track pedestrians in a video. · Achieved state of the art results after extensive hyperparameter searching using parallelized grid searching.	github
Pegasos SVM Solver <i>Technologies: Python, Optimization Methods,C++, MPI</i> · Implemented a solver to train a Support Vector Machine for a classification task from scratch. · Extended the implementation to support kernelized SVMs as well as multi-class classification. · Parallelized the implementation on MPI achieving significant speedups.	github
GrabCut: Graph Cut Based Image Segmentation <i>Technologies: Python,networkx, scikit-learn</i> · Implemented graph cuts for interactive image segmentation using Gaussian Mixture Models to estimate probabilities. · Used Gaussian Mixture Models to model the foreground and background probabilities	github

TECHNICAL STRENGTHS

Languages	C/C++, Python, MATLAB, Java, HTML, CSS, Javascript
ML/DL/CV	PyTorch, Keras, OpenCV, scikit-learn, ffmpeg
Software, Libraries & Tools	Git, LaTeX, OpenMP, MPI, SQL, Bash

RELEVANT COURSES COMPLETED

Core Science: Distributed Systems, Database Systems, Operating Systems, Introduction to Parallel and Scientific Computing, Computer Graphics, Computer Networks, Algorithms Analysis and Design, Data Structures, Linux Tools and Scripting.

ML/AI Courses: Statistical Methods in AI, Computer Vision, Artificial Intelligence, Optimization Methods, Mobile Robotics, Machine Learning for Natural Science.

Other Courses: Digital Image Processing, Digital Signal Analysis, Linear Algebra, Probability Theory, Discrete Mathematics.

PAST ACHIEVEMENTS, AWARDS AND SERVICE

Served as a reviewer for CVPR 2022-25, ECCV 2022-24, ICCV 2023, NeurIPS 2023-24, WACV 2020-23, ICLR 2025, AISTATS 2025

Recognized as **Outstanding/Top Reviewer** at BMVC 2021, CVPR 2022, ECCV 2022, and NeurIPS 2024

Won the essay competition at International Computer Vision Summer School 2023

Qualified for ACM-ICPC Asia Amritapuri Onsite Regionals in 2019.

Honourable Mention in Indian National Olympiad for Informatics and participated in Asia Pacific Informatics Olympiad (2016).