

EDUCATION

International Max Planck Research School for Intelligent Systems (IMPRS-IS)	Oct 2021-April 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 <i>Shyamgopal Karthik, Ameya Prabhu, Puneet K. Dokania, Vineet Gandhi</i>	<i>ICLR 2021</i> Paper Code
Learning from Long-Tailed Data with Noisy Labels <i>Shyamgopal Karthik, Jerome Revaud, Boris Chidlovskii</i>	<i>ICCV-W 2021</i> Paper Slides
Simple Unsupervised Multi-Object Tracking <i>Shyamgopal Karthik, Ameya Prabhu, Vineet Gandhi</i>	<i>Arxiv</i> Paper
ViNet: Pushing the limits of Visual Modality for Audio-Visual Saliency Prediction Samyak Jain, Pradeep Yarlagadda, Shreyank Jyoti, <i>Shyamgopal Karthik</i> , Ramanathan Subramanian, Vineet Gandhi	<i>IROS 2021</i> Paper Code
Exploring 3 R's of Long-term Tracking: Re-detection, Recovery and Reliability <i>Shyamgopal Karthik, Abhinav Moudgil, Vineet Gandhi</i>	<i>WACV 2020</i> 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 2022-24, ECCV 2022-24, ICCV 2023, NeurIPS 2023-24, WACV 2020-23 BMVC 2020-23

Recognized as **Outstanding Reviewer** at BMVC 2021, CVPR 2022 and, ECCV 2022

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).