Sameer Ambekar

Ph.D. Researcher @ TU Munich | Vision-Language Models, Reasoning & Robustness
Visiting Researcher @ Stanford, USA & University of British Columbia, Canada

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Open to Internships Starting 2027; always excited to collaborate on VLM Reasoning, Distribution Shifts, and Test-Time Adaptation.

Recent Acceptance: NeurIPS 2026 Spotlight (Top 3.7%), main track, co-first author of *"Entropy Minimization without Model Collapse"*

Research Interests

Deep Learning, Computer Vision, RL: Adapting Vision-Language Models (VLMs) with reasoning abilities using GRPO (Group Relative Policy Optimization) and test-time strategies.

Education

Technical University of Munich (TU Munich) — *Munich, Germany*
Konrad Zuse School of Excellence in Reliable AI (relAI)
Ph.D. student in Deep Learning and Computer Vision — *2023 – present*
Advisor: Prof. Dr. Julia Schnabel
Funded by the DAAD Konrad Zuse AI Excellence Program, supported by the Federal Ministry of Research, Technology and Space.

Stanford University — *Stanford, California, USA*
Research stay as a Ph.D. student — *2026*
Test-time Reasoning and Scaling for Medical Imaging
Advisor: Prof. Dr. Akshay Chaudhari

University of British Columbia — *Vancouver, Canada*
Research stay as a Ph.D. student — *2026*
Reasoning with Vision-Language Models
Advisor: Prof. Dr. Xiaoxiao Li

University of Amsterdam (UvA) — *Amsterdam, Netherlands*
Research Master's in Artificial Intelligence (MSc AI) (Thesis grade: Excellent, 48 ECTS) — *2021 – 2023*
Thesis: Test-time Adaptation: Generating Variational Labels and Models
Advisors: Prof. Dr. Cees Snoek & Zehao Xiao

Research Experience

University of Amsterdam — *Amsterdam, Netherlands*
Research Intern during MSc AI — *June 2022 – June 2023*
Advisors: Prof. Cees Snoek, Prof. Xiantong Zhen & Zehao Xiao

Indian Institute of Technology Delhi (IIT Delhi) — *Delhi, India*
Research Assistant in Deep Learning, before MSc AI — *January 2019 – July 2021*
Advisor: Prof. Prathosh AP

Indian Council of Medical Research (ICMR), NITM — *Belgaum, India*
Research Trainee and Bachelor's Thesis — *2017 – 2018*
Advisors: Dr. Subarna Roy (Scientist G) & Pramod Kumar (Scientist B)

Publications

Perceiving and Reasoning: Improving Visual Evidence Use in Pathology VLMs
Sameer Ambekar, Gexin Huang, Myeongkyun Kang, Beidi Zhao, Zu-hua Gao, Daniel M. Lang, Julia A. Schnabel, Xiaoxiao Li
Under review; preprint coming soon

Entropy Minimization without Model Collapse: Mitigating Prediction Bias in Medical Imaging
Tim Nielen*, **Sameer Ambekar***, Johannes Kiechle, Daniel M. Lang, Julia A. Schnabel
*Conference on Neural Information Processing Systems (**NeurIPS**), 2026* ★ **Spotlight, Top 3.7%**

The Mean is the Mirage: Entropy-Adaptive Model Merging under Heterogeneous Domain Shifts in Medical Imaging
Sameer Ambekar, Reza Nasirigerdeh, Lina Felsner, Daniel M. Lang, Julia A. Schnabel
arXiv preprint

Hierarchical Adaptive networks with Task vectors for Test-Time Adaptation
Sameer Ambekar, Daniel M. Lang, Julia A. Schnabel
*Winter Conference on Applications of Computer Vision (**WACV**), 2026* **[Algorithms track]**

Selective Test-Time Adaptation for Unsupervised Anomaly Detection using Neural Implicit Representations
Sameer Ambekar, Cosmin I. Bercea, Julia A. Schnabel
MICCAI 2024 ADSMI 🏆 **Best Paper Award**

Non-Parametric Neighborhood Test-Time Generalization: Application to Medical Image Classification
Sameer Ambekar, Daniel M. Lang, Julia A. Schnabel
MICCAI 2024 EMERGE

GeneralizeFormer: Layer-Adaptive Model Generation across Test-Time Distribution Shifts
Sameer Ambekar, Zehao Xiao, Xiantong Zhen, Cees G. M. Snoek
*Winter Conference on Applications of Computer Vision (**WACV**), 2025*

Learning Variational Neighbor Labels for Test-Time Domain Generalization
Sameer Ambekar*, Zehao Xiao*, Jiayi Shen, Xiantong Zhen, Cees G. M. Snoek
*Conference on Lifelong Learning Agents (**CoLLAs**), 2024*

Unsupervised Domain Adaptation for Semantic Segmentation of NIR Images through Generative Latent Search
Prashant Pandey*, Aayush Kumar Tyagi*, **Sameer Ambekar**, Prathosh AP
*European Conference on Computer Vision (**ECCV**), 2020* ★ **Spotlight, Top 5%**

Variational Pseudo Labeling for Test Time Domain Generalization
Sameer Ambekar, Zehao Xiao, Jiayi Shen, Xiantong Zhen, Cees G. M. Snoek
*International Conference on Learning Representations Workshop (**ICLR**), 2023* ★ **Spotlight**

SKDCGN: Source-free Knowledge Distillation of Counterfactual Generative Networks using cGANs
Sameer Ambekar*, Matteo Tafuro*, Ankit*, Diego van der Mast*, Mark Alence*, Christos Athanasiadis
*European Conference on Computer Vision Workshop (**ECCV**), 2022*

Thesis

Test-time Adaptation: Generating Variational Labels and Models
Sameer Ambekar
Master's Thesis in AI, AI for Medical Imaging Lab, University of Amsterdam
Advisors: Prof. Cees Snoek, Prof. Xiantong Zhen & Zehao Xiao

Teaching & Supervision at TU Munich

- **MSc Thesis & Project Supervision**, TU Munich. Past students: **Tim Nielen**, MSc Informatics, TU Munich (Grade: 1.0, the highest grade in the German system), *The Dynamics of Entropy Minimization for Medical Imaging*; **Andras Gaspar**, BSc, TU Munich.
- **Open MSc Thesis: JEPA for Medical Imaging**, TU Munich. Proposal (PDF)
- **From General to Clinical: Adapting Foundation Models for Medical Images**, seminar for master's students, TU Munich *Summer 2026*
  Organizer. Slides
- **From General to Clinical: Adapting Foundation Models for Medical Images**, seminar for master's students, TU Munich *Winter 2025/26*
  Organizer.

Selected Awards, Honors and Project Grants

- 🏛 **BaCaTeC Research Grant**, Bavaria California Technology Center seed grant funding a second Ph.D. research stay at Stanford University in 2027 ★ **Project Grant** *2026*
- ★ **Spotlight Paper [Top 3.7%]** at NeurIPS 2026 main track for *Entropy Minimization without Model Collapse* (co-first author) *2026*
- ★ **Spotlight Paper [Top 5%]** at ECCV 2020 for *Unsupervised Domain Adaptation for Semantic Segmentation of NIR Images* *2020*
- ★ **Spotlight Paper** at ICLR 2023 Domain Generalization Workshop *2023*
- 🏆 **Best Paper Award** at MICCAI 2024 ADSMI Workshop for *Selective Test-Time Adaptation* *2024*
- 🎓 **ICML Gold Reviewer Award** for paper reviewing contributions *2026*
- DigiCosme **Full Master's Scholarship** of €12,000, Université Paris-Saclay, France *2021*
- Google Conference Grant for ECCV 2020 Spotlight paper *2020*
- Secured 6th rank nationally in the National Science Talent Search Examination, India

Professional Responsibilities

- **Reviewer:** NeurIPS, ICML, CVPR, ECCV, ICCV, IEEE TNNLS, Elsevier's Applied Soft Computing, Springer Nature's Journal of Translational Medicine

Machine Learning Summer Schools

- International Computer Vision Summer School (ICVSS), Italy *2024*
- Eastern European Machine Learning Summer School (EEML) by Google DeepMind, Slovakia *2024*
- Oxford Machine Learning Summer School (OxML), Deep Learning, by the University of Oxford, UK *2020, 2022*
- Regularization Methods for Machine Learning 2021 (RegML 2021) *2021*
- PRAIRIE/MIAI PAISS 2021 AI Summer School, by Inria & NAVER LABS, France *2021*
- Machine Learning Summer School (MLSS-Indo 2020, Indonesia) *2020*

Selected Research Projects

Knowledge Distillation of Counterfactual Generative Networks, DL-2 Course Project, UvA *April 2022*

- Deep Learning 2 course final project at UvA, published at the ECCV 2022 VIPriors Workshop, requiring 'no edits'

Semantic Segmentation of Head and Neck Histopathological Images Using Self-Supervision *2020 – 2021*
Advisor: Prof. Prathosh AP, IIT Delhi

- Self-supervised techniques show enormous potential with limited labels; applied here to a context-specific task.

Target-Independent Domain Adaptation (TIGDA) for WBC using Generative Latent Search *2020 – 2021*
Advisor: Prof. Prathosh AP, IIT Delhi

- Acknowledged for contributions to the IEEE TMI 2020 paper

Skills

- **Programming Languages:** Python, C, C++
- **Machine Learning, Deep Learning:** PyTorch, TensorFlow, Keras, NumPy, OpenCV, PIL
- **Tools:** LaTeX, Google Cloud Platform (GCP), Git, Ubuntu Bash

- **Languages:** English (Fluent), German, Kannada, Hindi & Marathi

References

- **Prof. Dr. Julia Schnabel**, Director, IML Helmholtz Munich & CompAI TU Munich
- **Prof. Dr. Cees Snoek**, Head, Video & Image Sense Lab, and Director, ELLIS Amsterdam Unit, UvA
- **Prof. Dr. Xiantong Zhen**, Research Scientist, United Imaging Healthcare Co., Ltd.; previously UvA