Danush Kumar Venkatesh

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▬▬ Work Experience

03/2025– 07/2025 **PhD AI Research Intern**, *Intuitive Surgical, California*
Topic: Scalable & controllable video generation model
  - Developed a resource efficient video diffusion method for surgical robotic applications
  - Studied the pre-training scalability of models on large scale video data

01/2023– Present **PhD researcher**, *NCT Dresden*, Germany
Topic: Generation of training data for surgical applications
  - Developed Sim2Real methods to generate large-scale synthetic data with labels
  - Surgical video synthesis with diffusion models for rare & edge cases
  - Research on evaluation strategies for synthetic datasets

05/2021– 04/2022 **Machine Learning Student Intern**, *Helmholtz Zentrum Dresden*, Germany
Investigation on GAN model evaluation and robustness studies of ML models
  - Assessment of generated and adversarial images with model agnostic geometric metrics

01/2018– 08/2019 **Research Assistant**, *Indian Institute of Science*, India
Worked with a team of 5 members on the image analysis of microscopy data

▬▬ Education

01/2023– Present **Doctorate**, *Applications of generative modeling*, TU Dresden, Germany

10/2019– 12/2022 **Master of Science**, *Computational Science*, TU Bergakademie, Freiberg
Grade – 1.4 (German grading system)
Specialization: Deep learning, Image classification & segmentation

▬▬ Publications

10/2025 **Mitigating Surgical Data Imbalance with Dual-Prediction Video Diffusion Model**
Work done during internship at Intuitive (Under review), `https://arxiv.org/abs/2510.07345`

09/2025 **Towards Application Aligned Synthetic Surgical Image Synthesis**
Accepted at GenAI4Health workshop (*NeurIPS* 2025), `https://arxiv.org/abs/2509.18796`

03/2025 **Mission Balance: Generating Under-represented Class Samples with Video Diffusion models**, *Top 9% of submissions*
Accepted at Medical Imaging Computing & Computer Assisted Intervention (*MICCAI* 2025), `https://arxiv.org/abs/2505.09858`

10/2024 **Data Augmentation for Surgical Scene Segmentation with Anatomy-Aware Diffusion Models**
Accepted at Winter Conference on Applications of Computer Vision (*WACV* 2025), `https://arxiv.org/abs/2410.07753`

08/2024	**One-step unpaired image translation with consistency diffusion models**
	Article in European Conference on Computer Vision workshop (*ECCV 2024*), `https://arxiv.org/abs/2408.09822`
02/2024	**Exploring semantic consistency in unpaired image translation**, *Top 10% of submissions*
	Journal article in International Journal of Computer Assisted Radiology and Surgery (IJCARS), `https://link.springer.com/article/10.1007/s11548-024-03079-1`
06/2022	**Detection of adversarial samples - a geometrical approach**
	The research work conducted during internship at HZDR, `https://arxiv.org/abs/2206.08738`

Professional Engagements

04/2025	**Surgical image synthesis with generative models**
	Organized & contributed to a workshop on surgical computer vision involving 25 participants
07/2024	**Spatially controllable image generation**, *Top 8% of submissions*
	Poster presentation at East European Summer School with 200 participants
06/2023	**Texture consistent Sim2Real Translation**, *Top 12% of submissions*
	Poster presentation at Generative Modeling Summer School with 120 participants
04/2023-Present	**Synthetic images for medical AI**
	○ Supervised 10+ students on research projects, bachelor and master thesis
	○ Secured research funding of 5000 euros for research projects from SECAI, TU Dresden.
07/2022	**Equivariant neural networks for image segmentation**
	Contribution talk at Swiss Equivariant Learning workshop with 100 participants, `https://www.hzdr.de/publications/Publ-34917`
12/2021	**Geometric identification of adversarial samples**, *Helmholtz AI*
	Contribution talk at ML symposium(HZDR), `https://zenodo.org/record/5788483`
04/2021–10/2021	**Teaching Assistant**, *TU Bergkademie*, Freiberg
	Responsible to handle and organize exercise sessions on programming fundamentals for 50 international students

Reviewer

○ International Conference on Information Processing in Computer-Assisted Interventions (IPCAI) 2025, 2026
○ IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2025
○ International Conference on Learning Representations (ICLR) 2025, 2026
○ IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2024

Awards

○ Best poster award at EEML summer school out of 150 submissions
○ SECAI Master student fellowship of 2000 euros
○ Best personal programming project from TU Freiberg (out of 22 projects)
○ University scholarship during bachelor studies
○ Sports fellowship for representing cricket team in intra-national level