Saarthak Kapse

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Education

Stony Brook University, NY, USA **Feb, 2021 – Present**
Doctor of Philosophy, Biomedical Informatics
Advised by: *Prateek Prasanna*, *Dimitris Samaras*, *Joel Saltz*
Collaborators: *Srijan Das* (Assistant Professor at UNC Charlotte, USA), *Pushpak Pati* (Senior Data Scientist at JNJ, Switzerland), *Rajarsi Gupta* (Assistant Professor at Stony Brook University, USA), *Chao Chen* (Associate Professor at Stony Brook University, USA), *Maria Vakalopoulou* (Assistant Professor at CentraleSupelec, University Paris Saclay, France)

Indian Institute of Technology, Bombay, India **Aug, 2016 – Dec, 2020**
Bachelor of Technology, Electrical Engineering

Publications (selected)

1. **SI-MIL: Taming Deep MIL for Self-Interpretability in Gigapixel Histopathology** *CVPR 2024*
   Saarthak Kapse*, P. Pati*, S. Das, J. Zhang, C. Chen, M. Vakalopoulou, J. Saltz, D. Samaras, R. Gupta, P. Prasanna
2. **Learned representation-guided diffusion models for large-image generation** *CVPR 2024*
   A. Graikos*, S. Yellapragada*, M. Le, **Saarthak Kapse**, P. Prasanna, J. Saltz, D. Samaras
3. **Attention de-sparsification matters: Inducing diversity in pathology representation learning** *MedIA 2023*
   Saarthak Kapse, S. Das, J. Zhang, R. Gupta, J. Saltz, D. Samaras, P. Prasanna
4. **Prompt-MIL: Boosting Multi-Instance Learning Schemes via Task-specific Prompt Tuning** *MICCAI 2023*
   J. Zhang, **Saarthak Kapse**, K. Ma, P. Prasanna, J. Saltz, M. Vakalopoulou, D. Samaras
5. **ViT-DAE: Transformer-driven Diffusion Autoencoder for Histopathology Image Analysis** *MICCAI-W 2023* (workshop)
   X. Xu, **Saarthak Kapse**, R. Gupta, P. Prasanna
6. **SAM-Path: A Segment Anything Model for Semantic Segmentation in Digital Pathology** *MICCAI-W 2023*
7. **Precise location matching improves dense contrastive learning in digital pathology** *IPMI 2023*
   Saarthak Kapse*, J. Zhang*, K. Ma, P. Prasanna, M. Vakalopoulou, J. Saltz, D. Samaras
8. **CD-Net: Histopathology Representation Learning Using Context-Detail Transformer Network** *ISBI 2023*
   Saarthak Kapse, S. Das, P. Prateek
9. **Subtype-Specific Spatial Descriptors of Tumor-Immune Microenvironment are Prognostic of Survival in Lung Adenocarcinoma** *ISBI, 2022*
   Saarthak Kapse, L. Healy, R. Moffitt, R. Gupta, P. Prasanna
10. **Predicting mechanical ventilation and mortality in COVID-19 using radiomics and deep learning on chest radiographs: a multi-institutional study** *Diagnostics, 2021*
    Saarthak Kapse*, J. Bae*, et al.

Experience

Graduate Researcher | IMAGINE Lab, Stony Brook University, NY, USA Feb, 2021 – Present

- Exploring Efficient Pan-Cancer Foundational Models; Vision-Language Models for Concept-Grounded methods (ongoing)
- Self-Interpretability in gigapixel Histopathology Using Handcrafted Features Grounded Model (CVPR'24)
- Domain-Driven Self-Supervised Learning in Computational Pathology (MedIA'23; IPMI'23; ISBI'23)
- Generative Modeling Encompassing Large-Image Generation and Synthetic Data Augmentation Using Diffusion Models (CVPR'24, MICCAI-W'23)

Research Intern | Insitro, San Francisco, USA May, 2024 – Present

Working on representation learning for single-cell imaging advised by *Srinivasan Sivanandan* and *Dr. Justin Lee*

Undergraduate Researcher | Indian Institute of Technology, Bombay, India Jan, 2020 – Dec, 2020

Gene Mutation Prediction from non-small cell lung cancer histopathology slides advised by *Dr. Amit Sethi*

Research Intern | Philips Innovation Campus, Bangalore, India May, 2019 – Jul, 2019

Liver Lesion Segmentation from CT Scans using 3D Volumetric Deep Learning Approach advised by *Dr. M.S Dinesh*

Technical Skills

Technologies: Computer Vision, Deep Learning, Self-Supervised learning, Generative Modelling, Vision-Language Model
Domains: Computational Pathology, Medical Imaging (MRI, CT, X-Ray)
Languages & Frameworks: Python, PyTorch, TensorFlow, Hugging Face, QuPath, MLflow, LaTeX