

# 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 CentraleSupélec, University Paris Saclay, France)

**Indian Institute of Technology, Bombay, India**

**Aug, 2016 – Dec, 2020**

*Bachelor of Technology, Electrical Engineering*

## Publications

- SI-MIL: Taming Deep MIL for Self-Interpretability in Gigapixel Histopathology** *Under Review (CVPR)*  
Saarthak Kapse\*, P. Pati\*, S. Das, J. Zhang, C. Chen, M. Vakalopoulou, J. Saltz, D. Samaras, R. Gupta, P. Prasanna
- Learned representation-guided diffusion models for large-image generation** *Under Review (CVPR)*  
A. Graikos\*, S. Yellapragada\*, M. Le, Saarthak Kapse, P. Prasanna, J. Saltz, D. Samaras
- 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
- 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
- ViT-DAE: Transformer-driven Diffusion Autoencoder for Histopathology Image Analysis** *MICCAI-W 2023 (workshop)*  
X. Xu, Saarthak Kapse, R. Gupta, P. Prasanna
- SAM-Path: A Segment Anything Model for Semantic Segmentation in Digital Pathology** *MICCAI-W 2023 (workshop)*  
J. Zhang, K. Ma, Saarthak Kapse, J. Saltz, M. Vakalopoulou, P. Prasanna, D. Samaras
- 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
- CD-Net: Histopathology Representation Learning Using Context-Detail Transformer Network** *ISBI 2023*  
Saarthak Kapse, S. Das, P. Prateek
- 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
- 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 Histopathology Using Handcrafted Features Grounded Model (one paper under submission)
- 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 (MICCAI-W'23; one paper under submission)

**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

## Academic & Technical Details

**Research Experience:** Computational Pathology, Medical Imaging, Self-Supervised learning, Concept based learning

**Courses:** Computer Vision, Deep Learning, Machine Learning, Reinforcement Learning, Automatic Speech Recognition

**Languages & Frameworks:** Python, PyTorch, TensorFlow, Hugging Face, Openslide, QuPath, Palantir, L<sup>A</sup>T<sub>E</sub>X