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

1. **SI-MIL: Taming Deep MIL for Self-Interpretability in Gigapixel Histopathology**   *Under Review*
   Saarthak Kapse*, P. Pati*, S. Das, J. Zhang, C. Chen, M. Vakalopoulou, J. Saltz, D. Samaras,   *(CVPR)*
   R. Gupta, P. Prasanna

2. **Learned representation-guided diffusion models for large-image generation**   *Under Review*
   A. Graikos*, S. Yellapragada*, M. Le, **Saarthak Kapse**, P. Prasanna, J. Saltz, D. Samaras   *(CVPR)*

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*
   X. Xu, **Saarthak Kapse**, R. Gupta, P. Prasanna   *(workshop)*

6. **SAM-Path: A Segment Anything Model for Semantic Segmentation in Digital Pathology**   *MICCAI-W 2023*
   J. Zhang, K. Ma, **Saarthak Kapse**, J. Saltz, M. Vakalopoulou, P. Prasanna, D. Samaras   *(workshop)*

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**   *ISBI, 2022*
   of Survival in Lung Adenocarcinoma
   Saarthak Kapse, L. Healy, R. Moffitt, R. Gupta, P. Prasanna

10. **Predicting mechanical ventilation and mortality in COVID-19 using radiomics and deep**   *Diagnostics, 2021*
    learning on chest radiographs: a multi-institutional study
    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, LaTeX