Ashish Sinha

ashishsinha108@gmail.com | HomePage | LinkedIn | GitHub | Google Scholar

Education

Simon Fraser University Nov. 2021 – Jun. 2024
Master's in Computer Science (thesis) | Advisor(s): Prof. Ghassan Hamarneh *Vancouver, Canada*

Indian Institute of Technology (IIT) Roorkee Jul. 2016 – Jul. 2020
Bachelor's in Materials Science | Advisor(s): Prof. K.S. Suresh *Roorkee, India*

Research Experience

Machine Learning Researcher Jul. 2024 – Present
Noah's Ark Lab, Huawei Technologies | Advisor: Tongtong Cao *Toronto, Canada*

- Enhanced open-vocabulary object detection of small tableware objects by 32% via scalable training of vision foundation models (FM) for robotic manipulation.
- Developed an efficient zero-shot 6D pose estimation method using 2D/3D FMs running at 4 FPS.
- Co-developed a training-free, uncertainity-guided, object reconstruction and 6D pose estimation method using 3D diffusion priors achieving state-of-the-art performance. Currently under review.
- Developed and deployed motion planners for 9 robotic manipulation tasks using vision-language action models.

Graduate Research Assistant Nov. 2021 – Aug 2024
Simon Fraser University | Advisor: Prof. Ghassan Hamarneh *Vancouver, Canada*

- Designed a novel diffusion architecture for generating anatomical trees using neural fields. Accepted at **MICCAI**.
- Developed a differential rendering framework to generate large-scale synthetic clinical data. Accepted in **MedIA**.
- Worked on developing an ethics framework for medical image synthesis. Currently under review.
- Developed a training-free approach for scalable dermatological data synthesis using Stable Diffusion and ControlNet. Currently under review.

Research Intern Dec. 2020 – Aug. 2021
GIST Vision Lab | Advisor: Prof. Jonghyun Choi *Gwangjou, South Korea*

- Developed a novel algorithm for multi-target point cloud domain adaptation achieving SOTA classification performance. Accepted at **CVPR** (W).

Research Intern Jun. 2019 – Aug. 2019
Preferred Networks | Advisors: Dr. Yohei Sugawara & Dr. Yuichiro Hirano *Tokyo, Japan*

- Developed a novel vector quantization (VQ)-based Guided Attention GANs for CT reconstruction from biplanar DRRs. Accepted at **NeurIPS** (W).

Research Intern Mar. 2019 – Jul. 2019
ETS Montreal | Advisor: Prof. Jose Dolz *Montreal, Canada*

- Designed a novel refinement-based parallel attention module for Semantic Segmentation of internal organs achieving SOTA Dice scores. Accepted at **JBHI**.

Selected Publications (Google Scholar)

- "*TrIND*: Representing Anatomical Trees by Denoising Diffusion of Implicit Neural Fields", **A. Sinha**, G. Hamarneh. **MICCAI**, 2024.
- "*DermSynth3D*: Synthesis of *in-the-wild* Annotated Dermatology Images", **A. Sinha**, J. Kawahara, A. Pakzad,$\cdots$, G. Hamarneh. **MedIA**, 2024.
- "*MEnsA*: Mixup Ensemble Average for Multi Target Domain Adaptation on Point Clouds", **A. Sinha**, J. Choi. **CVPR** (W), 2023.
- "Multi-Scale Self-Guided Attention Networks for Medical Image Segmentation", **A. Sinha**, J. Dolz. **JBHI**, 2020.
- "*GAGAN*: CT Reconstruction from Biplanar DRRs using GAN with Attention", **A. Sinha**, Y. Hirano, Y. Sugawara. **NeurIPS** (W), 2019.

Skills

Programming Languages: Python, BASH, C++, MATLAB
Developer Tools: VIM, Git, GitHub, GitLab, VS Code, Docker, Singularity, SLURM, Blender, Tableau
Libraries: PyTorch, NumPy, Pytorch3D, Open3D, Diffusers, Weights & Biases, Gradio, JAX, Taichi, Chainer