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 *Burnaby, BC, Canada*

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

Experience

Machine Learning Researcher Jul. 2024 – Present
Noah's Ark Lab, Huawei Technologies | Python, Pytorch, Pytorch3D, JAX, ROS *Toronto, ON, 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 .[Under Review]
- Developed and deployed motion planners for 9 robotic manipulation tasks using vision-language action models.

Computer Vision Researcher - 3D Vision Nov. 2021 – Aug 2024
Simon Fraser University | Advisor: Ghassan Hamarneh | Python, Pytorch, Pytorch3D *Burnaby, BC, Canada*

- Developed a novel diffusion-based algorithm for generating anatomical trees using neural fields. [MICCAI]
- Engineered infrastructure using SLURM, Bash, Python, and W&B to support large-scale experimentation.
- Developed a differential rendering framework to generate large-scale synthetic clinical data. [MedIA]
- Worked on developing an ethics framework for medical image synthesis. [Under Review]
- Developed a training-free approach for scalable dermatological data synthesis using Stable Diffusion and ControlNet. [Under Review]

Risk Analyst - Consumer Lending Aug. 2020 – Aug 2021
Wells Fargo Pvt. Ltd. | Python, SAS, MS Excel *Bangaluru, India*

- Developed and maintained risk assessment models for the Home Lending team.
- Automated pipelines to generate executive-ready model summaries in PowerPoint for shareholder presentations, reducing manual effort and turnaround time by 8×.
- Documented SEC-compliant models to ensure regulatory transparency and audit readiness.

Computer Vision Researcher - 3D Vision Dec. 2020 – Aug. 2021
GIST Vision Lab | Advisor: Jonghyun Choi | Python, Pytorch *Gwangjou, South Korea*

- Developed an efficient algorithm for multi-target point cloud domain adaptation achieving state-of-the-art classification performance on Scannet, ModelNet, and ShapeNet. [CVPR (W)]

Computer Vision Researcher - Generative AI Jun. 2019 – Aug. 2019
Preferred Networks Inc. | Advisors: Yohei Sugawara & Yuichiro Hirano | Python, Chainer *Tokyo, Japan*

- Designed Guided Attention for improving the CT reconstruction from biplanar DRRs.
- Designed a novel VQ-Guided Attention in GANs for CT reconstruction with efficient memory and invariant image quality. [NeurIPS (W)]

Computer Vision Researcher - Semantic Segmentation Mar. 2019 – Jul. 2019
ETS Montreal | Advisor: Jose Dolz | Python, Pytorch *Montreal, Canada*

- Designed a novel attention module for Semantic Segmentation of medical modality achieving best performance on multiple datasets. [JBHI]

Data Scientist Aug. 2018 – May. 2019
Ryelore AI | Python, Pytorch *London, UK*

- Trained semantic segmentation models on satellite imagery datasets for finding farming areas.
- Created tests and automated scripts for data preprocessing.
- Developed methods to predict solar energy output of the farms for expanding the solar farms in the Asia-Pacific region.

Selected Publications

- "*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.

Honors & Awards

- Multiple graduate fellowships at SFU (Ralph M Howatt, DBMiner, Backwater/Jost).
- Bronze medal in PetFinder.my Adoption Challenge hosted on Kaggle.

Technical 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, Keras
Concepts: Computer Vision, Generative Models, Diffusion Models, Object Segmentation and reconstruction