

Ashish Sinha

🔗 Research Interests →

Intersection of Computer Vision and Machine Learning.

Especially, Representation Learning, Scene Understanding, and Generative Modeling

With applications in Medical Imaging and Life Sciences.

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🎓 Education

- 2021 – 2024 **Simon Fraser University (SFU)**,
MSc (Thesis), Computer Science,
Advisor: Prof. Ghassan Hamarneh
- 2016 – 2020 **Indian Institute of Technology Roorkee (IITR)**,
B. Tech, Materials Science,
Advisor: Prof. K.S. Suresh

📄 Publications (Google Scholar)

★ Indicates Equal Contribution and First Authorship.

- 2024 | MICCAI **TrIND: Representing Anatomical Trees by Denoising Diffusion of Implicit Neural Fields**
A. Sinha, G. Hamarneh
International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
- 2024 | MedIA **DermSynth3D: Synthesis of in-the-wild Annotated Dermatology Images**
A. Sinha*, J. Kawahara*, A. Pakzad*, K. Abhishek, M. Rutheven, E. Ghorbel, A. Kacem, D. Aouada, G. Hamarneh
Medical Image Analysis (MedIA) | IF: 13.8
- 2023 | CVPR **MEnSA: Mixup Ensemble Average for Multi Target Domain Adaptation on Point Clouds**
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops
A. Sinha, J. Choi
- 2020 | JBHI **Multi-Scale Self-Guided Attention Networks for Medical Image Segmentation**
Journal of Biomedical and Health Informatics | IF: 7.7 | Citations: 500+
A. Sinha, J. Dolz
- 2019 | NeurIPS **GAGAN: CT Reconstruction from Biplanar DRRs using GAN with Attention**
Medical Imaging Meets NeurIPS Workshop
A. Sinha, Y. Sugawara, Y. Hirano
- 2020 | ICPR **Deep Learning Based Dimple Segmentation for Quantitative Fractography**
Industrial Machine Learning Workshop. **Spotlight**
A. Sinha, K.S. Suresh

💻 Research and Industry Experience

- July 2024– Present **Researcher**, Noah's Ark Lab, Huawei Technologies, 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 a zero-shot 6D pose estimation method using 2D/3D FMs running at 4 FPS.
 - Co-developed a training-free uncertainty-guided object reconstruction and 6D pose estimation method using 3D diffusion priors (under review).
 - Developed and deployed motion planners for 9 robotic manipulation tasks using vision-language action models.
 - Advisor(s): Tongtong Cao
- Nov 2021– Jun 2024 **Research Assistant**, Medical Image Analysis Lab (MIAL), SFU, Burnaby, Canada
- Worked on representation learning and generative modeling of anatomical trees using diffusion modeling of neural fields. Work accepted at **MICCAI 2024**.
 - Created a differentiable 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.
 - Worked on lifting ventricular structures from a single 2D image to 3D using implicit neural representations.
 - Advisor(s): Prof. Ghassan Hamarneh

- Dec 2020– **Research Intern**, GIST Vision Lab, South Korea
 Aug 2021
- Designed an efficient algorithm for unsupervised multi-target domain adaptation of 3D point clouds.
 - Work accepted at L3D-IVU **CVPR** (2023) workshop.
 - Advisor: Prof. Jonghyun Choi.
- Aug 2020– **Risk Analyst**, Wells Fargo, Bangalore, India
 Aug 2021
- 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.
- June 2019– **Research Intern**, Preferred Networks, Tokyo
 Aug 2019
- Designed Guided Attention for improving the CT reconstruction from biplanar DRRs.
 - Designed a vector quantization (VQ) method in GANs for CT reconstruction with efficient memory and invariant image quality.
 - Work accepted to Medical Imaging meets **NeurIPS** Workshop (2019).
 - Advisor(s): Yohei Sugawara, Yuichiro Hirano and Dr. Kenta Oono.
- Mar 2019– **Research Intern**, École de Technologie Supérieure Montreal, Canada
 July 2019
- Designed a novel attention module for Semantic Segmentation of abdominal region.
 - Paper accepted at the Journal of Biomedical and Health Informatics (**JBHI**)
 - Advisor: Prof. Jose Dolz.
- Aug 2018– **Data Scientist Intern**, Ryelore AI, London
 May 2019
- 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.

🏆 Awards & Achievements

- Feb 2024 **Ralph M Howatt Graduate Scholarship**, *SFU Computing Science*
 Aug 2023 **DBMiner Graduate Scholarship**, *SFU Computing Science*
 Jan 2023 **Backwater/Jost Grad Scholarship**, *SFU Computing Science*, Ebco Eppich Award Competition
 Apr 2020 **NTIRE 2020 Demoireing Challenge**, *CVPR 2020*, Rank 13
 Apr 2019 **PetFinder.my Adoption Challenge**, *Kaggle*, Bronze Medal
 July 2017 **Merit-cum-Means Scholarship for 3 years**, *IIT Roorkee*
 Mar 2017 **Science and Technology Quiz**, *Cognizance IIT Roorkee*, Winner

🔧 Skills

- Languages Python, BASH, C++, SQL
 Frameworks PyTorch, JAX, Chainer, Keras, ROS
 Libraries ManiSkill3, NumPy, Pandas, Pytorch3D, Open3D, Diffusers, Weights & Biases, Gradio, Mayavi
 Dev Tools nVIM, Git, GitHub, VS Code, Docker, Singularity, SLURM, Blender, Tableau, \LaTeX , Blender