

Ashish Sinha

📍 Research Interests →

Intersection of Computer Vision, Graphics, and Machine Learning.
Especially, Representation Learning, Neural Rendering, and 3D Reconstruction.
With applications in Medical Imaging and Life Sciences.
→ Eligible for O-1, EB-1/2 visa (US).

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🎓 Education

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

📄 Publications

★ 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– **Research Assistant**, Medical Image Analysis Lab (MIAL), SFU, Burnaby, Canada
- Jun 2024
- Worked on representation learning and generative modeling of anatomical trees using diffusion modeling of neural fields [MICCAI].
 - Engineered infrastructure using SLURM, Bash, Python, and W&B to support large-scale experimentation.
 - Created a differentiable rendering framework to generate large-scale synthetic clinical data [MedIA].
 - Worked on lifting ventricular structures from a single 2D image to 3D using implicit neural representations.
 - Worked on developing an ethics framework for medical image synthesis [Under Review].
 - Advisor(s): Prof. Ghassan Hamarneh
- Dec 2020– **Research Intern**, GIST Vision Lab, South Korea
- Aug 2021
- Worked on multi-target domain adaptation for 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 vector quantization (VQ) method for efficient memory with 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.

Teaching Experience

- Fall 2022 **Intro to Computing Science, CMPT 120**, Graduate TA
- Responsible for grading, and helping with *Python* assignments for a batch of 450 students.
 - Course co-ordinator(s): Prof. Diana Cukierman and Prof. Angelica Lim.
- Spr 2023, '24 **Intro to Computer Systems, CMPT 295**, Graduate TA
- Responsible for grading, and helping with assignments in *C* and *Assembly* for a batch of 190 students.
 - Course co-ordinator(s): Prof. Anne Lavergne.
- Jan 2018,'19 **General Chemistry, CYN 006**, Undergraduate TA
- Taught Organic and Physical chemistry to a batch of 86 students.
- Jul 2018 **Intro to Computer Programming, MTN-103**, Undergraduate TA
- Taught the fundamentals of programming in C++ to a batch of 80 students.

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(A), C/C++(I), Java(B), SQL(A), SAS(B), Assembly(B)
Frameworks PyTorch, Taichi, JAX, Chainer, Keras
Utilities Git, SLURM, (Neo)Vim, Docker, \LaTeX , Blender, MeshLab, PyVista, Mayavi, Tableau
Communication English(SRW), Hindi(SRW), Japanese(SRW)

Relevant Courses

Online Cognitive Science, Intro to Psychology, CS231n, CS224n, Stat 110, Intro to Deep Reinforcement Learning, Game Theory, Intro to Graph Theory,
Classroom Neural Advanced Rendering, ML for Life Sciences, Algorithm Design, Computer Vision, Geometric Modeling in Computer Graphics, Machine Learning, Generative Modelling, Linear Algebra, Differential/Integral Calculus, PDEs,