Ashish Sinha

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Research Interests →

Intersection of Computer Vision, Graphics, and Machine Learning.
Especially it's Application in Medical Imaging and Life Sciences.

Education

2021 – 2023 **Simon Fraser University**,
MSc, Computer Science,
Advisor: Prof. Ghassan Hamarneh
Sec. Advisor: Prof. Andrea Tagliasacchi

2016 – 2020 **Indian Institute of Technology Roorkee**,
B. Tech, Materials Science,
Advisor: Prof. K.S. Suresh

Publications

2020 **Multi-Scale Self-Guided Attention Networks for Medical Image Segmentation**, *Journal of Biomedical and Health Informatics*
A. Sinha, J. Dolz
Citations: 268+

2019 **GA-GAN: CT Reconstruction from Biplanar DRRs using GAN with Attention**, *NeurIPS*
A. Sinha, Y. Sugawara, Y. Hirano
Medical Imaging Meets NeurIPS Workshop

2020 **Deep Learning Based Dimple Segmentation for Quantitative Fractography**, *ICPR (**Spotlight**)*
A. Sinha, K.S. Suresh
Industrial Machine Learning Workshop

2020 **Ntire 2020 Challenge on Image Demoireing: Methods and Results**, *CVPR (W)*
S. Yuan, [and 45 others, including **A. Sinha**]

⋆ Indicates Equal Contribution and First Authorship.

Experience

Sept 2021– Present **Research Assistant**, Medical Image Analysis Lab (MIAL), SFU, Burnaby, Canada
- Working on lifting ventricular structures from a single 2D image to 3D.
- Working on lesion detection on human meshes.
- Working on textured-mesh generation from a single image for medical applications.
- Advisor(s): Dr. Jeremy Kawahara, Prof. Ghassan Hamarneh.

Dec 2020– Aug 2021 **Research Intern**, GIST Vision Lab, South Korea
- Worked on multi-target domain adaptation for point clouds.
- Advisor: Prof. Jonghyun Choi.
- Work currently under review (CVPR 2023).

Aug 2020– Aug 2021 **Risk Analyst**, Wells Fargo, Bangalore, India
- Responsible for the development and maintenance of risk-assessment models.
- Automated the pipeline for summarising the model's execution results in a clean PPT.
- Responsible for maintaining the documentation.

June 2019–Aug 2019 **Research Intern**, Preferred Networks, Tokyo
- 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–July 2019 **Research Intern**, Ècole de Technologie Superieure Montreal, Canada
- 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.

Teaching Experience

Fall 2022 **Intro to Computing Science**, *CMPT 120*, Graduate TA
- Responsible for grading, and creating exams for a batch of 450 students.
- Organized office hours for helping students' assignments in *python*.
- Course co-ordinator(s): Prof. Diana Cukierman and Prof. Angelica Lim.

Spr 2023 **Intro to Computer Systems**, *Graduate TA*, CMPT 295
- Responsible for grading, and creating exams for a batch of 190 students.
- Organized office hours for helping students' assignments in *C* and *Assembly*.
- 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

Jan 2023 **Backwater/Jost Grad Scholarship**, *SFU Computing Science*, Ebco Eppich Award Competition
Nov 2021 **NeurIPS 2021 Travel Grant**, *NeurIPS*
Apr 2020 **NTIRE 2020 Demoireing Challenge**, *CVPR 2020*, Rank 13
Nov 2019 **NeurIPS 2019 Travel Grant**, *NeurIPS*
July 2019 **Secure and Private AI Scholarship**, *Udacity*
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

Selected Projects

Sept 2019–Mar 2020 **Automated Defect Detection at macro and micro scale (Bachelor Thesis)**, *Prof. K.S. Suresh, IIT Roorkee*
- Collected the images of Fe and Ti alloys at micro and macro scale.
- Developed an Attention-based U-Net-inspired model to segment surface defects and dimples in Fe and Ti respectively.
- Accepted for publication at ICPR (W) 2020 (**Spotlight**).

Apr 2020 **NTIRE 2020 Image Demoireing Challenge (CVPR 2020)**, *Self-motivated*
- Proposed feature fusion attention network for image demoireing.
- The method ranked 13 out of 173 participants. CVPRW Paper

May 2018 **Simplifying Rough Sketches Using Deep Learning [Code]**, *Self-motivated*
- Implemented the paper *Learning to Simplify: Fully Convolutional Networks for Rough Sketch Cleanup* by Simo-Serra et. al in PyTorch.

Skills

Languages Python(A), C/C++(I), Java(B), SQL(A), SAS(B), Assembly(B)
Frameworks PyTorch, Lightning, Chainer, Keras
Utilities Git, SLURM, (Neo)Vim, LaTeX, VS Code, MeshLab, PyVista, Mayavi, Tableau

Communication English(SRW), Hindi(SRW), Japanese(SRW)

Relevant Courses

Online CS231n: CNNs for Visual Recognition, CS224n: DL for NLP, CS229: Machine Learning, Stat 110 : Intro to Probability, Intro to Deep Reinforcement Learning, Algorithms Part 1 and 2 (Princeton), Game Theory, Intro to Graph Theory,

Classroom Neural Advanced Rendering, ML for Life Sciences, Algorithm Design, Computer Vision, Computer Graphics, Machine Learning, Generative Modelling, Linear Algebra, Differential/Integral Calculus, PDEs,