Kumar Abhishek

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Education

Simon Fraser University

Burnaby, Canada

Ph.D. in Computing Science, GPA: 4.33 — *Summer 2020 - Present*

- **Advisor**: Prof. Ghassan Hamarneh, Medical Image Analysis Lab
- **Supervisory Committee**: Prof. Manolis Savva, GrUVi Lab

M.Sc. (Thesis) in Computing Science, GPA: 4.07 — *Fall 2018 - Spring 2020*

- **Advisor**: Prof. Ghassan Hamarneh, Medical Image Analysis Lab
- **Examination Committee**: Prof. Mark Drew (SFU), Prof. Sandra Avila (University of Campinas, Brazil), Prof. Angel X. Chang (SFU)
- **Thesis**: Input Space Augmentation for Skin Lesion Segmentation in Dermoscopic Images **[Link]**

Indian Institute of Technology (IIT)

Guwahati, India

B.Tech. in Electronics and Communication Engineering — *Fall 2011 - Spring 2015*

- **Advisor**: Prof. Prithwijit Guha, Multimedia Analytics Lab
- **Thesis**: Summarization and Visualization of Large Volumes of Broadcast Video Data **[Link]**

Selected Publications

All publications on **Google Scholar** | **IF:** Impact factor | ***:** Equal contribution | Paper titles are hyperlinks to DOIs.

Journals:

(j7) Kumar Abhishek, Aditi Jain, Ghassan Hamarneh, "**Investigating the Quality of DermaMNIST and Fitzpatrick17k Dermatological Image Datasets**", *Nature Scientific Data*, 2025. **[IF: 5.8]**

(j6) Kumar Abhishek, Colin J. Brown, Ghassan Hamarneh, "**Multi-Sample ζ-mixup: Richer, More Realistic Synthetic Samples from a p-Series Interpolant**", *Journal of Big Data*, 2024. **[IF: 8.1]**

(j5) Ashish Sinha*****, Jeremy Kawahara*****, Arezou Pakzad*****, Kumar Abhishek, Enjie Ghorbel, Anis Kacem, Djamila Aouada, Ghassan Hamarneh, "***DermSynth3D*: Synthesis of *in-the-wild* Annotated Dermatology Images**", *Medical Image Analysis*, 2024. **[IF: 13.828]**

(j4) Kumar Abhishek*****, Zahra Mirikharaji*****, Alceu Bissoto, Catarina Barata, Sandra Avila, Eduardo Valle, M. Emre Celebi, Ghassan Hamarneh, "**A Survey on Deep Learning for Skin Lesion Segmentation**", *Medical Image Analysis*, 2023. **[IF: 13.828]**

(j3) Mengliu Zhao*****, Jeremy Kawahara*****, Kumar Abhishek, Sajjad Shamanian, Ghassan Hamarneh, "**Skin3D: Detection and Longitudinal Tracking of Pigmented Skin Lesions in 3D Total-Body Textured Meshes**", *Medical Image Analysis*, 2022. **[IF: 13.828]**

(j2) Kumar Abhishek, Jeremy Kawahara, Ghassan Hamarneh, "**Predicting the Clinical Management of Skin Lesions Using Deep Learning**", *Nature Scientific Reports*, 2021. **[IF: 4.996] [Media Coverage: Massive Science, The Wire Science]**.

(j1) Kumar Abhishek*****, Saeid Asgari Taghanaki*****, Joseph Paul Cohen, Julien Cohen-Adad, Ghassan Hamarneh, "**Deep Semantic Segmentation of Natural and Medical Images: A Review**", *Springer Artificial Intelligence Review*, 2020. **[IF: 9.588]**

Conferences and Workshops:

(c10) Kumar Abhishek, Jeremy Kawahara, Ghassan Hamarneh, "**Segmentation Style Discovery: Application to Skin Lesion Images**", *Medical Image Computing and Computer-Assisted Intervention (MICCAI) ISIC Skin Image Analysis Workshop*, 2024. **[Oral] [Best Paper Award]**

(c9) Kumar Abhishek, Ghassan Hamarneh, "**Lesion Elevation Prediction from Skin Images Improves Diagnosis**", *Medical Image Computing and Computer-Assisted Intervention (MICCAI) ISIC Skin Image Analysis Workshop*, 2024. **[Oral]**

(c8) Kumar Abhishek, Colin J. Brown, Ghassan Hamarneh, "**ζ-mixup: Richer, More Realistic Mixing of Multiple Images**", *Medical Imaging with Deep Learning (MIDL), 2023.*

(c7) Arezou Pakzad, Kumar Abhishek, Ghassan Hamarneh, "**CIRCLe: Color Invariant Representation Learning for Unbiased Classification of Skin Lesions**", *European Conference on Computer Vision (ECCV) ISIC Skin Image Analysis Workshop, 2022.* **[Oral]**

(c6) Zahra Mirikharaji, Kumar Abhishek, Saeed Izadi, Ghassan Hamarneh, "**D-LEMA: Deep Learning Ensembles from Multiple Annotations – Application to Skin Lesion Segmentation**", *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) ISIC Skin Image Analysis Workshop, 2021.* **[Oral] [Best Paper Award]**

(c5) Kumar Abhishek, Ghassan Hamarneh, "**Matthews Correlation Coefficient Loss for Deep Convolutional Networks: Application to Skin Lesion Segmentation**", *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2021.

(c4) Kumar Abhishek, Ghassan Hamarneh, Mark S. Drew, "**Illumination-based Transformations Improve Skin Lesion Segmentation in Dermoscopic Images**", *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) ISIC Skin Image Analysis Workshop, 2020.* **[Oral]**

(c3) Kumar Abhishek, Ghassan Hamarneh, "**Mask2Lesion: Mask-Constrained Adversarial Skin Lesion Image Synthesis**", *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) Workshop on Simulation and Synthesis in Medical Imaging (SASHIMI), 2019.*

(c2) Saeid Asgari Taghanaki, Kumar Abhishek, Ghassan Hamarneh, "**Improved Inference via Deep Input Transfer**", *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2019.* **[Early Accept]**

(c1) Saeid Asgari Taghanaki, Kumar Abhishek, Shekoofeh Azizi, Ghassan Hamarneh, "**A Kernelized Manifold Mapping to Diminish the Effect of Adversarial Perturbations**", *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), 2019.*

Work Experience

Medical Image Analysis Lab, Simon Fraser University — *Burnaby, Canada*

Graduate Research Assistant — *September 2018 - Present*

- Developed deep learning models for medical image segmentation, classification, and synthetic data generation, with a focus on skin images.
- Published 18+ research papers in top-tier journals, conferences, and workshops, which have collectively been cited 1400+ times (h-index = 15).

School of Computing Science, Simon Fraser University — *Burnaby, Canada*

Teaching Assistant — *Spring 2021, Summer 2021, Fall 2023, Spring 2024, Fall 2024, Spring 2025*

- Course planning, course elements' design: practice exercises and quizzes, grading of final projects, holding office hour sessions for questions, and project guidance for CMPT 340: Biomedical Computing (5×) and CMPT 419: Biomedical Image Computing (1×).

Altisource Labs — *Bengaluru, India*

Data Scientist — *April 2017 - July 2018*

- Developed algorithms for document image enhancement, OCR, and information extraction from document images for loan underwriting.
- Developed an automated real estate image tagging platform using deep learning for classification of uploaded images into scene categories.

Wipro Ltd. — *Bengaluru, India*

Machine Learning Engineer — *July 2015 - March 2017*

- Worked on fraud detection on internal employee data using big data and machine learning algorithms.
- Worked on several machine learning projects - from building an automated employee ticket handling system to predicting failures in a multi-node Hadoop cluster.

Multimedia Analytics Lab, IIT Guwahati — *Guwahati, India*

Undergraduate Research Assistant (Bachelor Thesis) | Supervisor: Dr. P. Guha, Assoc. Professor, Dept. of EEE — *August 2014 - March 2015*

- Developed a robust news presentation format detector for broadcast video analytics to identify various band elements and their layouts in broadcast news video frames. Evaluated the layout overlap with ground truth using data from recorded news videos of 4 English news channels.

Skills

Programming Python, MATLAB, Bash

Software PyTorch, Keras, Lightning, NumPy, SciPy, Scikit-Learn, Pandas, Matplotlib, Seaborn, OpenCV, MySQL, LaTeX, Anaconda, Git

Honors & Awards

Best Paper Award, MICCAI 2024 ISIC Skin Image Analysis Workshop — 2024

PhD Research Fellowship, Simon Fraser University — 2023, 2024

Outstanding Reviewer Honorable Mention, MICCAI 2023 — 2023

Computing Science Diversity Committee Awards Finalist, Simon Fraser University — 2023

Graduate Fellowship, School of Computing Science, Simon Fraser University — 2018, 2021, 2022, 2023, 2024

Graduate Fellowship, Faculty of Applied Sciences, Simon Fraser University — 2022, 2023, 2024

Helmut & Hugo Eppich Family Graduate Scholarship, Faculty of Applied Sciences, Simon Fraser University — 2021, 2022, 2023, 2024, 2025

Brian J. Blaha Memorial Graduate Scholarship, Faculty of Applied Sciences, Simon Fraser University — 2021, 2022, 2023

Best Paper Award, CVPR 2021 ISIC Skin Image Analysis Workshop — 2021

Special Graduate Entrance Scholarship, Dean of Graduate Studies, Simon Fraser University — 2020

Winner, Wipro Datathon, a machine learning competition with over 200 teams across all 11 offices of Wipro — 2017

Undergraduate Research Travel Grant, Department of Electronics and Electrical Engineering, IIT Guwahati — 2015

Service

Peer Reviewer

- **Journals:** Medical Image Analysis (MedIA), Transactions on Medical Imaging (TMI), Computerized Medical Imaging and Graphics (CMIG), Computer Methods and Programs in Biomedicine (CMPB), Computers in Biology and Medicine (CIBM), Nature Scientific Reports (Nat Sci Rep), Nature Scientific Data (Nat Sci Data), Journal of Nuclear Medicine (JNM), npj Imaging.
- **Conferences and Workshops:** MICCAI, International Skin Imaging Collaboration (ISIC) Skin Image Analysis Workshop, IPMI, MedNeurIPS.

Leadership

- **Lab admin** for the Medical Image Analysis Lab (2019 – Present) and SFU's local compute cluster Solar (2021 – Present).
- **Executive Committee** member of SFU Computing Science Graduate Student Association (2018 – 2020).

Volunteer Work

- Instructor for UBC Geering Up program for high school students on a hands-on introduction to Teachable Machine (2022).
- Mentor and judge for Technovation Girls BC, an entrepreneurship event for getting 10-18 year old girls interested in STEM fields (2019 – 2020).