

Curriculum Vitae

◇ Name: Siddhartha Gairola ◇ E-mail: sgairola@mpi-inf.mpg.de ◇ Website: <https://sidgairo18.github.io>

Education

- MPI for Informatics & Saarland University** Saarbrücken, Germany
Ph.D. Student, Computer Science Oct, 2022 - present
- Advisors: Prof. Bernt Schiele, Prof. Francesco Locatello
- International Institute of Information Technology, Hyderabad** Hyderabad, India
MS by Research in CSE 2018 - 2020
- Advisor: Prof. P. J. Narayanan
 - Thesis: *Image Representations for Style Retrieval, Recognition and Background Replacement Tasks*
 - CGPA: **9.75/10**
- BTech with Honours in CSE 2014 - 2018
- CGPA: **8.91/10**

Work Experience

- Microsoft Research, India - Research Fellow** Aug 2020 - Aug 2022
- Advisors: Dr. Mohit Jain, Dr. Nipun Kwatra
 - Developed a low-cost smartphone-based corneal topographer for keratoconus detection in collaboration with Sankara Eye Hospital. Published at ACM IMWUT/Ubicomp 2021.
 - Worked on training DNN models for abnormality detection in limited data settings. Published at EMBC 2021.
- Microsoft Research, India - Research Intern** Jan 2020 - Jul 2020
- Advisors: Dr. Mohit Jain, Dr. Nipun Kwatra
 - Worked on building smartphone based diagnostic solutions for eye diseases using mobile computing, computer vision and machine learning.
- Adobe Systems, India - Product Intern** Jun 2019 - Jan 2020
- Advisors: Balaji K., Mayur Hemani
 - Worked at the Media and Data Science Research lab.
 - Worked on Guided Few-shot Image Segmentation, improved on the prior state-of-the-art by 6%.
 - Published at IJCAI 2020 and filed a patent.
- IIT Hyderabad - Research Assistant** May 2016 - May 2019
- Advisor: Prof. P. J. Narayanan
 - Research assistant at the Center for Visual Information and Technology (CVIT)
 - Worked on representation learning for image style search and retrieval. Published at WACV 2020.
 - Also worked on task of color-consistent background replacement. Published at MMM 2018.
- Google Summer of Code (GSoC) - Student Developer** May 2018 - Aug 2018
- Was accepted as a developer for the Google Summer of Code Program for the 2nd time with Scilab.
 - Implemented a demo in C/C++ and Scilab as a working example for the MEX Library in Scilab.
- Google Summer of Code (GSoC) - Student Developer** May 2017 - Aug 2017
- Was accepted as a developer for the Google Summer of Code Program with the organization Scilab.
 - Implemented a C/C++ wrapper for Matlab MEX-API on current API Scilab.

Patents

- **S. Gairola**, M. Hemani, A. Chopra, J. Dahl, Balaji K. Improved Similarity Propagation for One-Shot and Few-Shot Image Segmentation (**US 16/906,954**), 2020.

Peer-Reviewed Publications

- (8.) **S. Gairola**, P. Joshi, A. Balasubramaniam, K. Murali, N. Kwatra, M. Jain. [Keratoconus Classifier for Smartphone-based Corneal Topographer](#). *44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) (2022)*.
- (7.) A. Aggarwal, **S. Gairola**, U. Uppadhyay, A. P. Vasishta, D. Rao, A. Goyal, K. Murali, N. Kwatra, and M. Jain. [Towards Automating Retinoscopy for Refractive Error Diagnosis](#). *In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), Volume 6, Issue 3, 2022*.
- (6.) **S. Gairola**, M. Bohra, N. Shaheer, N. Jayaprakash, P. Joshi, A. Balasubramaniam, K. Murali, N. Kwatra, and M. Jain. [SmartKC: Smartphone-based Corneal Topographer for Keratoconus Detection](#). *In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), Volume 5, Issue 4, 2021*.
- (5.) **S. Gairola**, F. Tom, N. Kwatra, and M. Jain. [RespireNet: A Deep Neural Network for Accurately Detecting Abnormal Lung Sounds in Limited Data Setting](#). *43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2021*.
- (4.) **S. Gairola**, A. Chopra, M. Hemani, Balaji K. [SimPropNet: Improved Similarity Propagation for Few-Shot Image Segmentation](#). *International Joint Conference on Artificial Intelligence (IJCAI), 2020*.
- (3.) **S. Gairola**, R. Shah, P. J. Narayanan. [Unsupervised Image Style Embeddings for Retrieval and Recognition Tasks](#). *IEEE Winter Conference on Applications of Computer Vision (WACV), 2020*.
- (2.) V. Kumar*, D. Khattar*, **S. Gairola***, Y. K. Lal*, V. Varma. [Identifying Clickbait: A Multi-Strategy Approach Using Neural Networks](#). *The 41st International ACM SIGIR Conference on Research & Development in Information Retrieval, 2018*.
- (1.) S. Rawat*, **S. Gairola***, R. Shah, P. J. Narayanan. [Find Me a Sky: A Data-Driven Method for Color-Consistent Sky Search and Replacement](#). *International Conference on Multimedia Modeling (MMM), 2018*.

*equal contribution

Papers Under-Review

- (1.) **S. Gairola**, M. Böhle, F. Locatello, B. Schiele. [How to Probe: Simple Yet Effective Techniques for Improving Post-hoc Explanations](#). *(under review)*.

Academic Services

Reviewer: ICML 2023, 2024; NeurIPS 2022, 2023; ICLR 2022, 2023, 2024; ECCV 2024; IHCI 2021
Volunteer: ICVGIP 2018

Talks & Conference Presentations

A DNN for Accurately Detecting Abnormal Lung Sounds in Limited Data Setting, *EMBC 2021* ([video](#)).
Improved Similarity Propagation for Few-shot Image Segmentation, *IJCAI 2020* ([video](#)).
Unsupervised Image Style Embeddings for Retrieval and Recognition Tasks, *WACV 2020* ([video](#)).

Selected Research Projects

Smartphone-based Corneal Topographer Nov 2020 - Oct 2021
Developed a low-cost smartphone-based corneal topographer. It provides a portable and scalable solution for the mass screening of keratoconus. Built the entire system: an AI powered smartphone app, the 3D printed attachment, and the processing software. [*Android, Python, PyTorch*; [project page](#)]

Abnormality Detection in Respiratory Signals Aug 2020 - Nov 2020
Developed a ‘ResNet34’ based model along with a suite of novel augmentation and fine-tuning techniques to effectively utilize small-sized datasets. The method improved upon the state-of-the-art for 4-class classification on the ICBHI dataset by 2.2%. [*Python, PyTorch*; [code](#)]

Similarity Propagation for Few-Shot Image Segmentation Jun 2019 - Jan 2020
Developed a deep learning system that leverages background-foreground similarity to perform few-shot image segmentation. The method achieved state-of-the-art results on the PASCAL-5i, COCO-20i and FSS datasets. [*Python, PyTorch*]

Unsupervised Image Style Representation Learning Jan 2019 - Jun 2019
Developed a deep learning model to learn robust style representations without supervision. Achieved state-of-the-art results across six datasets and it was published as a paper. [*Python, PyTorch*; [code](#)]

Sketching with Style Aug 2018 - Dec 2018
Implemented the ICCV 2017 paper “Sketching with Style” ([link](#)). Was able to reproduce the results provided in the paper and open-sourced the code. [*PyTorch, Python*; [code](#)]

Neural Clickbait Detection Engine May 2017 - Aug 2017
Developed a system to robustly identify clickbait social media posts. The system comprises of a siamese-network that fuses visual and textual information to learn a neural embedding used to detect clickbaits. [*Python, Keras*; [code](#)]

Color Consistent Background Replacement Jan 2017 - Apr 2017
Developed a data driven method for color-consistent sky search and replacement. A diverse set of skies consistent in color and illumination are retrieved from a curated dataset, and used to generate composites. The composites are re-ranked based on realism and diversity. [*MATLAB*; [project page](#)]

Awards & Achievements

- Awarded the **Dean’s Research Award** for a paper published at an international conference while in undergraduate, 2018.
- Awarded the **Dean’s List Award** for 6 semesters straight: Monsoon’15, ’16, ’17 & Spring’16, ’17, ’18
- Qualified for the **ACM ICPC Asia Onsite Regionals** twice (2015, 2016).
- **98.5** percentile in **JEE Advanced (2014)** examination among 150,000 students.
- **99.7** percentile in **JEE Main (2014)** examination among 1.2 million students.

Teaching Experience

Computer Graphics , IIIT Hyderabad	Spring 2019
Digital Image Processing , IIIT Hyderabad	Monsoon 2018
Computer Vision , IIIT Hyderabad	Spring 2018
Digital Image Processing , IIIT Hyderabad	Monsoon 2017
Artificial Intelligence , IIIT Hyderabad	Spring 2017
Digital Logic and Processors , IIIT Hyderabad	Monsoon 2016

The duties as a TA involved taking regular tutorials, setting up assignments and conducting evaluations.

Technical Skills

Working Knowledge	Bash, C/C++, Python, MATLAB, Octave, OpenCV, Android-SDK
Software & Tools	GNU/Linux, HTML, CSS, JavaScript, LaTeX, Excel
Deep Learning Frameworks	PyTorch, TensorFlow, Keras, Caffe
Past Experience	Java, OpenGL, WebGL, Django, Web2py