Siddhartha Gairola

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Education

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 - Present

· Working on problems in healthcare, computer vision and machine learning.
· Advisor: Dr. Mohit Jain, Dr. Nipun Kwatra

Microsoft Research, India - *Research Intern* Jan 2020 - Jul 2020

· Worked on building smartphone based diagnostic solutions for eye diseases using mobile computing, computer vision and machine learning.
· Advisor: Dr. Mohit Jain, Dr. Nipun Kwatra

Adobe Systems, India - *Research Intern* Jun 2019 - Jan 2020

· Worked in the **Media and Data Science Research** (MDSR) lab.
· Implemented a deep learning model in *Python, PyTorch* to perform **Few-shot Guided Segmentation** on images, beat the SOTA by 6%, published a paper and filed a patent for the same.
· Advisor: Balaji K., Mayur Hemani

IIIT Hyderabad - *Research Assistant* May 2016 - May 2019

· Research student at the Center for Visual Information and Technology (CVIT)
· Worked with Prof. P. J. Narayanan on problems in computer vision, machine learning and deep learning.

IIIT Hyderabad - *Teaching Assistant* Aug 2016 - May 2019

· Teaching Assistant for graduate and undergraduate courses - *Digital Logic and Processors, Artificial Intelligence, Digital Image Processing, Computer Vision, and Graphics.*
· The duties involved taking regular tutorials, setting up assignments and conducting evaluations.

Google Summer of Code (GSoC) - *Student Developer* May 2018 - Aug 2018

· Was accepted as a developer for the Google Summer of Code Program for a 2^{nd} time with Scilab org.
· 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 for 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. (2020), Improved Similarity Propagation for One-Shot and Few-Shot Image Segmentation **(US 16/906,954)**.

Peer-Reviewed Publications

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.*

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.*

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.*

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.*

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.*

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.*

Academic 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 for being in top 10% of the class in Monsoon 2015, 2016, 2017 and Spring 2016, 2017, 2018.
- Qualified for the **ACM ICPC Asia Onsite Regionals** twice (2015, 2016).
- **All India Rank 2262** in **JEE Advanced 2014** (**98.5%** percentile among 150,000 students).
- **All India Rank 3856** in **JEE Mains 2014** (**99.7%** percentile among 1.2 million students).

Academic Service

Reviewer: ICLR 2022, IHCI 2021.

Selected Projects

Guided Few-Shot Segmentation: Implemented a deep learning system to perform few-shot image segmentation with guidance propagation using *Python and PyTorch. Monsoon 2019*

Unsupervised Style Learning: Implemented a deep learning model in *Python and PyTorch* to learn robust style representations without supervision. Achieved state-of-the-art results for this task and was accepted as a paper (code). *Spring 2019*

*equal contribution

Sketching with Style: Implemented the paper Sketching with Style[b] (*ICCV 2017*) in *PyTorch and Python* (code). *Monsoon 2018*

Movie Genre Classification: Implemented a deep learning model to predict the genres of a movie based on its poster, using *Python and TensorFlow*. *Monsoon 2017*

Wiki-Search Engine: Implementation of an efficient and scalable search engine on Wikipedia dump in *Python*. Retrieve top relevant documents based on input query. Handled field as well as phrase queries. Documents were re-ranked based on 'tf-idf' measure. For fast retrieval used threading and multi-level indexing. *Monsoon 2017*

High Dynamic Range Images: HDR imaging - generating images with a greater range of luminance levels than which can be achieved by taking only a single photograph with a fixed exposure. Using tone mapping, high-boost filtering and bilateral filtering for improvements. *Monsoon 2016*

Tic-tac-toe Bot: Designed an automated agent bot to play the a modified version of tic-tac-toe game. Using a minimax algorithm and alpha-beta pruning. *Spring 2016*

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

References

Prof. P. J. Narayanan, Director, IIIT-Hyderabad, India (email)
Dr. Mohit Jain, Senior Researcher, Microsoft Research, India (email)
Dr. Nipun Kwatra, Principal Researcher, Microsoft Research, India (email)
Balaji Krishamurthy, Principal Scientist, Adobe Systems, India (email)
Mayur Hemani, Senior Research Scientist, Adobe Systems, India (email)

[b] J. Collomosse, T. Bui, M. Wilber, C. Fang, and H. Jin. Sketching with style: Visual search with sketches and aesthetic context. In 2017 IEEE International Conference on Computer Vision (ICCV), 2017.