

Suraj Srinivas

ssrinivas@seas.harvard.edu · suuraj.srinivas@gmail.com · suraj-srinivas.github.io

research interests

My research aims to **improve the scientific and mathematical understanding** of deep neural network models and their associated learning algorithms. Practically, I am interested in rigorous methods to build **interpretable, robust and computationally efficient** models.

work experience

- 2022 - **Postdoctoral Research Fellow**,
Harvard University, USA,
Faculty Advisor: Prof. Himabindu Lakkaraju
Research Topics: Trustworthy machine learning, robustness, large-scale generative models.

education

- 2021 **Doctor of Philosophy**,
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland,
Faculty Advisor: Prof. François Fleuret
Thesis: Gradient-based Methods for Deep Model Interpretability.
- 2017 **Master of Science (Engineering)**,
Indian Institute of Science, Bangalore, India,
Faculty Advisor: Prof. R. Venkatesh Babu
Thesis: Learning Compact Architectures for Deep Neural Networks.

internships

- winter 2020 **Research Intern**, *Qualcomm AI Research, Netherlands*,
Research on algorithms to sparsify neural networks.
- summer 2016 **Research Intern**, *DataGrokr, India / Verisk Analytics, USA*,
Speeding up inference on deep neural networks using tensor factorization.
- fall 2014 **Engineering Intern**, *Tonbo Imaging, Bangalore*,
Implemented image processing algorithms on FPGA for a thermal imaging camera.
- summer 2013 **Research Intern**, *Indian Institute of Science, Bangalore*,
Research on computational photography to perform camera jitter compensation.

awards and honors

- 2022 **Best paper award** at ICML *Interpretable ML for Healthcare* Workshop
- 2022 **Highlighted reviewer** at *International Conference on Learning Representations (ICLR)*
- 2021 EPFL EDEE **PhD thesis distinction award** for top 8% thesis in EE
- 2019 ICML travel grant for ICML 2019
- 2017 **Best paper award** at NeurIPS *Learning with Limited Data* Workshop
- 2015 Xerox Research India travel grant for BMVC 2015
- 2014 **All India Rank 399** (99.8%ile) in the Graduate Aptitude Test in Engineering (GATE) for entrance to graduate school in electronics and communications engineering
- 2010 **State Rank 191** (99.8%ile) in the Karnataka Common Entrance Test (CET) for entrance to undergraduate engineering programmes.

selected publications

- 2022 **Suraj Srinivas***, Kyle Matoba*, Hima Lakkaraju, François Fleuret. (*co-first-author)
“Efficient Training of Low-Curvature Neural Networks”
Neural Information Processing Systems (NeurIPS)
- 2022 Tessa Han, **Suraj Srinivas**, Hima Lakkaraju.
“Which Explanation Should I Choose? A Function Approximation Perspective to Characterizing Post hoc Explanations”
Neural Information Processing Systems (NeurIPS)
ICML Interpretable ML for Healthcare Workshop - **Best Paper Award**
- 2021 **Suraj Srinivas**, François Fleuret.
“Rethinking the Role of Gradient-based Attribution Methods in Model Interpretability”
International Conference on Learning Representations (ICLR) - **Oral**
- 2018 **Suraj Srinivas**, François Fleuret.
“Knowledge Transfer with Jacobian Matching”
International Conference on Machine Learning (ICML)
NeurIPS Learning with Limited Data (LLD) Workshop - **Best Paper Award**

additional publications

- 2023 Anna Meyer*, Dan Ley*, **Suraj Srinivas**, Hima Lakkaraju.
“On Minimizing the Impact of Dataset Shifts on Actionable Explanations”
Uncertainty in Artificial Intelligence (UAI) - **Oral**
- 2022 Marwa El Halabi, **Suraj Srinivas**, Simon Lacoste-Julien.
“Data-Efficient Structured Pruning via Submodular Optimization”
Neural Information Processing Systems (NeurIPS)
- 2022 **Suraj Srinivas**, Andrey Kuzmin, Markus Nagel, Mart van Baalen, Andrii Skliar, Tijmen Blankevoort.
“Cyclical Pruning for Sparse Neural Networks”
Computer Vision and Pattern Recognition Workshops (CVPRW) - **Oral**
- 2019 **Suraj Srinivas**, François Fleuret.
“Full-Gradient Representation for Neural Network Visualization”
Neural Information Processing Systems (NeurIPS)
- 2017 **Suraj Srinivas**, Akshayvarun Subramanya, R. Venkatesh Babu.
“Training Sparse Neural Networks”
Computer Vision and Pattern Recognition Workshops (CVPRW) - **Oral**
- 2016 **Suraj Srinivas**, R. Venkatesh Babu.
“Learning the Architecture of Deep Neural Networks”
British Computer Vision Conference (BMVC)
- 2015 **Suraj Srinivas**, R. Venkatesh Babu.
“Data-free Parameter Pruning for Deep Neural Networks”
British Computer Vision Conference (BMVC)

manuscripts under review

- 2023 **Suraj Srinivas***, Sebastian Bordt*, Hima Lakkaraju. (*co-first-author)
“Which Models have Perceptually-Aligned Gradients? An Explanation via Off-Manifold Robustness”
Preliminary version: *ICML 2023 workshop on New Frontiers in Adversarial Machine Learning*
- 2023 Usha Bhalla*, **Suraj Srinivas***, Hima Lakkaraju. (*co-first-author)
“Verifiable feature attributions: A bridge between post hoc explainability and inherent interpretability.”
Preliminary version: *ICML 2023 workshop on Interpretable Machine Learning for Healthcare*
- 2023 Tessa Han, **Suraj Srinivas**, Hima Lakkaraju.
“Efficient estimation of the local robustness of machine learning models.”
Preliminary version: *ICML 2023 workshop on Formal Verification of Machine Learning*
- 2023 Dan Ley, Leonard Tang, Matthew Nazari, Hongjin Lin, **Suraj Srinivas**, and Hima Lakkaraju.
“Consistent explanations in the face of model indeterminacy via ensembling”
Preliminary version: *ICML 2023 workshop on Interpretable Machine Learning for Healthcare*

book chapters

- 2017 **Suraj Srinivas**, Ravi Kiran Sarvadevabhatla, Konda Reddy Mopuri, Nikita Prabhu, Srinivas SS Kruthiventi, R. Venkatesh Babu.
“A taxonomy of deep convolutional neural nets for computer vision”,
Book chapter: *Deep Learning for Medical Image Analysis, Elsevier*
Journal version: *Frontiers in Robotics and AI*

talks

- 03/2023 *Pitfalls and Opportunities with Feature Importance Methods*
[MERL seminar series](#), Boston
- 07/2022 *Pitfalls and Opportunities with Feature Attribution Methods*
Simons Institute, UC Berkeley
- 06/2022 *Pitfalls and Opportunities with Feature Attribution Methods*
Vanderbilt University, USA
- 03/2022 *Cyclical Pruning for Neural Network Sparsity*
Google Sparsity Reading Group
- 08/2021 *Pitfalls of Saliency Map Interpretation in Deep Neural Networks*
HES-SO, Sierre, Switzerland
- 05/2021 *Pitfalls of Saliency Map Interpretation in Deep Neural Networks*
Harvard University, USA
- 04/2021 *Rethinking the Role of Gradient-based Attribution Methods for Model Interpretability*
ICLR (virtual)
- 01/2020 *Neural Network Interpretability using Full-Gradient Representation*
Indian Institute of Science, Bangalore
- 01/2020 *Full-Gradient Representation for Neural Network Visualization*
[ML for Astrophysicists Club](#)
- 11/2019 *Full-Gradient Representation for Neural Network Visualization*
Swiss Machine Learning Day, Lausanne
- 05/2019 *Complete Saliency Maps using Full-Jacobians*
Valais / Wallis AI workshop, Martigny

07/2018 *Knowledge Transfer with Jacobian Matching*
ICML, Stockholm

07/2016 *Making Deep Neural Networks Smaller and Faster*
Deep Learning Conf, Bangalore

reviewing

Conferences AAAI, CVPR, ECCV, NeurIPS (2020) ; WACV, ICML, ICCV, NeurIPS (2021);
ICLR, ICML, NeurIPS (2022); ICLR, AISTATS (2023)

Journals IEEE SP-Letters, Elsevier Neural Networks, IEEE T-PAMI, Nature Communications

teaching

2023 **Co-instructor** for *Interpretability and Explainability in ML*
Instructors: Prof. Hima Lakkaraju, Jiaqi Ma, Suraj Srinivas
Harvard University, USA
Webpage: <https://interpretable-ml-class.github.io/>

2018, '19, '21 **Teaching Assistant** for *Deep Learning*
Instructor: Prof. François Fleuret
EPFL, Switzerland

2021 **Guest Lecturer** on *Interpretability for Deep Learning for Computer Vision*
Instructor: Prof. R. Venkatesh Babu
Indian Institute of Science, Bangalore

research mentoring

2022-23 Tessa Han (PhD candidate, Harvard)
Local Function Approximation to Characterize Explanations, NeurIPS 2022
Efficient Estimation of Local Robustness

2023 Usha Bhalla (PhD student, Harvard)
Verifiable Feature Attributions

2023 Daniel Ley (PhD student, Harvard)
On Minimizing the Impact of Dataset Shifts on Actionable Explanations, UAI 2023

2022 Vincent Micheli & Karthigan Sinnathamby (M.Sc. students, EPFL)
Multi-task Reinforcement Learning with a Planning Quasi-Metric

2017 Akshayvarun Subramanya (Research Assistant, IISc)
Estimating Confidence for Deep Neural Networks via Density Modeling, SPCOM 2017

2016 Lokesh Boominathan (Research Assistant, IISc)
Compensating for Large In-plane Rotations in Natural Images, ICVGIP 2016

service

2023 Co-organizing "XAI in Action: Past, Present, and Future Applications"
NeurIPS 2023 workshop (upcoming)