

# Amartya Sanyal

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## Education

**D.Phil in Computer Science (Advisor : Dr. Varun Kanade and Dr. Philip H.S. Torr)**

*Passed with Minor Corrections*

UNIVERSITY OF OXFORD, ST. HUGH'S COLLEGE

2017 - 2021

**B.Tech. in Computer Science and Engineering (Minor in Linguistics Theory)**

*CPI - 9.4/10.0*

INDIAN INSTITUTE OF TECHNOLOGY, KANPUR

2013 - 2017

## Professional Experience

**Postdoctoral Fellow, ETH AI Center and Max Planck Institute for Intelligent Systems**

*Zürich & Tübingen*

WITH PROF. FANNY YANG AND PROF. BERNHARD SCHÖLKOPF

*October 2021 - Now*

**Research Assistant, University of Oxford**

*Oxford, UK*

WITH PROF. PHILIP H.S. TORR

*June 2021 - September 2021*

**Part Time Researcher, Facebook AI Research**

*London, UK*

WITH DR. EDWARD GREFENSTETTE

*November 2020 - April 2021*

## Grants

2022

**Awarded an Hasler Stiftung Grant of 50,000 CHF**, Principal Investigator of a project “Understanding the Interaction of Privacy and Fairness in modern ML Algorithms”

*ETH Zürich*

## Teaching

### INSTRUCTOR

'22 **Co-Instructor— Projects in Machine Learning Research**, Dept. of Computer Science, ETH Zürich

'22 **Co-Instructor— Guarantees in Machine Learning**, Dept. of Computer Science, ETH Zürich

### TUTOR

'21 **Tutor in Computational Learning Theory**, Dept. of Computer Science, University of Oxford

'19, '20 **Tutor in Theory of Optimization**, Department of Engineering Science, University of Oxford

'18, '19 **Tutor in Machine Learning**, Wadham College, Worcester College, Somerville College, University of Oxford

'18, '19, '20 **Tutor in Machine Learning**, Dept. of Computer Science, University of Oxford

'17 **Teaching Assistant in Computational Complexity**, Department Computer Science, University of Oxford

'14 **Academic Mentor in Linear Algebra, Real Analysis and ODEs**, Indian Institute of Technology (IIT) Kanpur

## Advised Students

'20 **Sharan Gopal**, Master's Student in Advanced Computer Science, University of Oxford

'21 **Yaxi Hu**, Master's Student in Statistics, ETH Zürich

'22 **Piersilvio De Bartolomeis**, Master's Student in Data Science, ETH Zürich

'22 **Gizem Yüce**, Master's Student in Data Science, ETH Zürich

'22 **John Hill**, Master's Student in Computer Science, Georgia Institute of Technology

'22 **Angelo Gnazzo**, Master's Student in Mathematics, ETH Zürich

'22 **Francesco Pinto**, D.Phil (Ph.D) Student, University of Oxford

'22 **Yunfan Zou**, Master's Student in Computer Science, ETH Zürich

## Academic duties

### WORKSHOP ORGANISATION

'23 **Workshop on “Pitfalls of limited data and computation for Trustworthy ML” in ICLR 2023,**

### JOURNAL REVIEWING

'22 **Transactions in Machine Learning Research,**

'20 **International Journal of Computer Vision,**

AREA CHAIR

'23 Artificial Intelligence and Statistics (AISTATS),

CONFERENCE REVIEWING

'22 NeurIPS2022, UAI2022, AISTATS 2022, ICML 2022, ICLR 2023,  
'21 NeurIPS 2021, AISTATS 2021, ICLR 2022, ICML 2021,  
'20 ICLR 2021, SODA 2020, NeurIPS 2020, ICML 2020, CVPR 2020, ECCV 2020,  
'19 NeurIPS 2019,

WORKSHOP REVIEWING

'21-'22 Workshop on Distribution Shifts, NeurIPS 2021, NeurIPS 2022  
'20 Workshop on Dataset Curation and Security, NeurIPS 2020  
'20 Reviewer for Workshop on Continual Learning, ICML 2020  
'19 Critiquing and Correcting Trends in Machine Learning, NeurIPS 2019

Research Experience

Facebook AI Research, Dr. Edward Grefenstette

RESEARCH INTERN, GENERALISATION IN REINFORCEMENT LEARNING

London, UK  
June 2020 - September 2020

Laboratory for Computational and Statistical Learning, Prof. Lorenzo Rosasco

VISITING RESEARCHER, IMPLICIT REGULARIZATION OF GRADIENT DESCENT

Genoa, Italy

June 2019 - July 2019

Twitter Cortex, Nicolas Koumchatzky

RESEARCH INTERN, ADVERSARIAL GENERATION OF DISCRETE SEQUENCES

New York, NY, USA

May, 2017 - August 2017

Montreal Institute of Learning Algorithms, Prof. Yoshua Bengio

RESEARCH INTERN , LANGUAGE MODELLING WITH ADAPTIVE SEGMENTATION

Montreal, QC, Canada

May, 2016 - July, 2016

Amazon.com - Guided by Dr. Atool Saroop and Dr. Rajeev Rastogi

MACHINE LEARNING INTERN, COMPETITIVE PRICING WITH THE MACHINE LEARNING SELLER SERVICE TEAM

Bengaluru, India

May, 2015 - July, 2015

Awards

'23 Rising Star in AI, KAUST  
'22 ELLIS Member, ELLIS Society  
'21-'23 ETH AI Center Postdoctoral Fellowships Award, Awarded by the ETH AI Center, Zürich, Switzerland  
'17-'21 Turing Doctoral Studentship Award, Awarded by The Alan Turing Institute, London, UK  
'19-'22 Top Reviewer Award, NeurIPS 2022, ICML 2020, NeurIPS 2019  
'14 & '16 Academic Excellence Award, Awarded to top 10% student, IIT Kanpur  
'13 KVPY(Kishore Vaigyanik Pratyashona Yojana) , Awarded to 280 students nationally by the Gov. of India

Talks

Oct '22 Max-Planck-Institut für Intelligente Systeme, Tübingen, Germany  
July '22 The Alan Turing Institute, London, UK  
June '22 Department of Engineering Science, University of Oxford, UK  
June '22 Department of Computer Science, University of Edinburgh, UK  
Oct '21 Department of Statistics, ETH Zürich, Switzerland  
Feb '21 Department of Computer Science, Harvard University, Boston  
Nov '20 Math Machine Learning seminar MPI MIS + UCLA, Max-Planck-Institut für Mathematik, Germany  
Nov '20 Max-Planck-Institut für Informatik, Saarbrücken, Germany  
Oct '20 Machine Learning and Computer Vision Group, Institute of Science and Technology, Vienna, Austria  
Oct '20 Thoth team, Inria Grenoble Rhône-Alpes, Grenoble, France  
Sep '20 Department of Computer Science and Engineering, Indian Institute of Technology, Hyderabad, India  
Aug '20 Department of Computer Science and Engineering, Indian Institute of Technology, Kanpur, India

Program Committees

2018 Wining and Dining Officer, St. Hugh's College MCR, University of Oxford  
2019 Vice-President, St. Hugh's College MCR, University of Oxford  
2015 Editor, Vox Populi, Campus Newsletter of IIT Kanpur, IIT Kanpur  
2016 Coordinator, SIGML - Special Interest Group in Machine Learning, IIT Kanpur

## Conference and Journal Publications

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### How robust are pre-trained models to distribution shift?

Yuge Shi, Imant Daunhawer, Julia E. Vogt, Philip H.S. Torr, Amartya Sanyal  
*International Conference on Learning Representations (ICLR)*, 2023

### A law of adversarial risk, interpolation, and label noise

Daniel Paleka, Amartya Sanyal  
*International Conference on Learning Representations (ICLR)*, 2023

### Towards fast and effective single-step adversarial training

Pau Jorge, Amartya Sanyal, Adel Bibi, Ricardo Volpi, Gregory Rogez, Puneet K. Dokania, Philip H. S. Torr  
*Advanced in Neural Information Processing Systems (NeurIPS)*, 2022

### How unfair is private learning?

Amartya Sanyal, Yaxi Hu, Fanny Yang  
*Conference on Uncertainty in Artificial Intelligence (UAI)* Oral Paper, 2022

### Open Problem: Do you pay for Privacy in Online learning?

Amartya Sanyal, Giorgia Ramponi  
*Conference on Learning Theory (COLT)*, Open Problem, 2022

### How Benign is Benign Overfitting ?

Amartya Sanyal, Varun Kanade, Philip H.S. Torr, Puneet K. Dokania  
*International Conference on Learning Representations (ICLR)*, Spotlight Paper, 2021

### Progressive Skeletonization: Trimming more fat from a network at initialization

Pau Jorge, Amartya Sanyal, Harkirat S. Behl, Philip H. S. Torr, Gregory Rogez, Puneet K. Dokania  
*International Conference on Learning Representations (ICLR)*, 2021

### Stable Rank Normalization for Improved Generalization in Neural Networks and GANs

Amartya Sanyal, Philip H.S. Torr, Puneet K. Dokania  
*International Conference on Learning Representations (ICLR)*, Spotlight Paper, 2020

### The Intriguing Effects of Focal Loss on the Calibration of Deep Neural Networks

Jishnu Mukhoti, Viveka Kulharia, Amartya Sanyal, Stuart Golodetz, Philip H. S. Torr, Puneet K. Dokania  
*Advances in Neural Information Processing Systems (NeurIPS)*, 2020

### TAPAS: Tricks to Accelerate (encrypted) Prediction As a Service

Amartya Sanyal, Matt Kusner, Adria Gascon, Varun Kanade  
*International Conference on Machine Learning (ICML)*, 2018

### Optimizing non-decomposable measures with deep networks

Amartya Sanyal, Pawan Kumar, Purushottam Kar, Sanjay Chawla, Fabrizio Sebastiani  
*Springer, Machine Learning* (2018). 2018

### Agent based simulation of the evolution of society as an alternate maximization problem

Amartya Sanyal, Sanjana Garg, Asim Unmesh, Harish Karnick  
*International Conference on Behavioral, Economic, Socio-cultural Computing (BESC)*, 2017

### A Hybrid Deep Architecture for Face Recognition in Real-Life Scenario

Amartya Sanyal, Ujjwal Bhattacharya, Swapna K. Parui  
*Lecture Notes in Computer Science (Vol. 10481)*, 2016

## Workshop Publications (Some under submission)

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### Certified defences hurt generalisation

Piersilvio De Bartolomeis, Jacob Clarysse, Fanny Yang, Amartya Sanyal  
*NeurIPS 2022: Workshop on Understanding Deep Learning Through Empirical Falsification* Contributed Talk, 2022

### Semi-private learning via low dimensional structures

Yaxi Hu, Francesco Pinto, Amartya Sanyal, Fanny Yang  
*Third Workshop on Seeking Low-Dimensionality in Deep Neural Networks*, 2023

### Catastrophic Overfitting is a bug but also a feature

Guillermo Ortiz-Jimenez, Pau Jorge, Amartya Sanyal, Adel Bibi, Puneet Dokania, Pascal Frossard, Gregory Rogez, Philip H. S. Torr  
*ICML 2022: Workshop on New Frontiers In Adversarial Machine Learning*, 2022

### Robustness via Deep Low Rank Representations

Amartya Sanyal, Varun Kanade, Philip H.S. Torr, Puneet Dokania  
*ICML 2018: Workshop on Theory and Application of Deep Generative Models*, 2018

### Multiscale sequence modeling with a learned dictionary

Bart Merriënboer, Amartya Sanyal, Hugo Larochelle, Yoshua Bengio  
*ICML 2017: Workshop on Machine Learning in Speech and Language Processing*, 2017