Pritish Kamath

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Brief Bio

Pritish is currently pursuing a PhD. in Computer Science at MIT. His research focuses on theoretical aspects of computer science, in particular, on understanding the computational hardness in problems across different domains such as algebraic complexity and communication complexity. His research interests also include understanding the theoretical foundations of machine learning and especially deep learning.
Previously, he finished undergrad in Computer Science & Engineering at IIT Bombay, where he was awarded the *President of India Gold Medal* for the best academic performance in the graduating batch. He was a Research Fellow at Microsoft Research India before joining MIT.

Education

2019 (expected) **PhD.** (ongoing) in Electrical Engineering & Computer Sciences
Massachusetts Institute of Technology
Advisors: Madhu Sudan (Harvard) & Ronitt Rubinfeld (MIT)

2015 **S.M.** in Electrical Engineering & Computer Sciences
Massachusetts Institute of Technology
Advisor: Madhu Sudan (Microsoft Research New England, MIT)
S.M. Thesis: Communication complexity of permutation-invariant functions

2012 **B.Tech.** in Computer Science and Engineering
Indian Institute of Technology, Bombay
Advisor: Supratik Chakraborty
B.Tech. Thesis: Studies on Preservation Theorems and Weaker Ehrenfeucht-Fraïssé games
CGPA (core): = 9.70/10.0; *CGPA (overall)* = 9.77/10.0

Awards and Honors

2013-14 **Akamai Presidential Fellowship**, MIT

2013 **Best Paper Award** *(co-winner)*, Conference on Computational Complexity (CCC)

2012 **President of India Gold Medal** for best academic performance in the graduating batch across all disciplines of B.Tech programme at IIT Bombay

2012 **Institute Silver Medal** for best academic performance in the graduating batch of B.Tech programme in the Computer Science and Engineering Dept, IIT Bombay

2012 **Minor in Mathematics** with GPA of 10.0/10.0

2008 **All India Rank of 21** in IIT Joint Entrance Examination (among 375,000 students)

2008 **Gold Medal** and **Certificate of Merit** in *Indian National Physics Olympiad* for being ranked among the top 35 students in the country

2008 **Certificate of Merit** in *Indian National Mathematics Olympiad 2008* (ranked among the top 30); attended the International Mathematics Olympiad Training Camp 2008

Other Experience

▷ **Research Intern**, **Google DeepMind, London, UK** — Csaba Szepesvári
Generalization theory for neural networks [May 2018 - Sep 2018]

▷ **Research Fellow**, **Microsoft Research India, Bangalore, India** — Neeraj Kayal
Lower Bounds in Arithmetic Complexity Theory [Jun. 2012 - July 2013]

Publications

Note: Authors are in alphabetical order of last name unless marked with (*)

Journal Papers

SICOMP 2016 / CACM 2017 *Arithmetic circuits: A chasm at depth three*
Ankit Gupta, Pritish Kamath, Neeraj Kayal, Ramprasad Saptharishi

J. ACM 2014 *Approaching the chasm at depth four*
Ankit Gupta, Pritish Kamath, Neeraj Kayal, Ramprasad Saptharishi

Conference Papers / Manuscripts

ITCS 2019 *Adventures in Monotone Complexity and TFNP* [pdf]
Mika Göös, Pritish Kamath, Robert Robere, Dmitry Sokolov

NIPS 2018 *Bayesian Inference of Temporal Task Specifications from Demonstrations* [pdf]
(*) Ankit Shah, Pritish Kamath, Shen Li, Julie Shah

STOC 2018 *Monotone Circuit Lower Bounds from Resolution* [pdf]
Ankit Garg, Mika Göös, Pritish Kamath, Dmitry Sokolov

CCC 2018 *Dimension Reduction for Polynomials over Gaussian Space and Applications* [pdf]
Badih Ghazi, Pritish Kamath, Prasad Raghavendra

Manuscript *The Optimality of Correlated Sampling* [pdf]
Mohammad Bavarian, Badih Ghazi, Elad Haramaty, Pritish Kamath, Madhu Sudan, Ronald Rivest

CCC 2017 *Query-to-Communication Lifting for* P^{NP} [pdf]
Mika Göös, Pritish Kamath, Toniann Pitassi, Thomas Watson

ISIT 2017 *Improved bounds for universal 1-bit compressed sensing* [pdf]
Jayadev Acharya, Arnab Bhattacharyya, Pritish Kamath

ITCS 2017 *Compression in a Distributed Setting* [pdf]
Badih Ghazi, Elad Haramaty, Pritish Kamath, Madhu Sudan

FOCS 2016 *Decidability of non-interactive simulation of joint distributions* [pdf]
Badih Ghazi, Pritish Kamath, Madhu Sudan

SODA 2016 *Communication complexity of permutation-invariant functions* [pdf]
Badih Ghazi, Pritish Kamath, Madhu Sudan

RANDOM 2015 *Communication with partial noiseless feedback* [pdf]
Bernhard Haeupler, Pritish Kamath, Ameya Velingker

FOCS 2013 *Arithmetic circuits: A chasm at depth three* [pdf] *(invited to SICOMP)*
Ankit Gupta, Pritish Kamath, Neeraj Kayal, Ramprasad Saptharishi

CCC 2013 *Approaching the chasm at depth four* [pdf] **(Best Paper Award)**
Ankit Gupta, Pritish Kamath, Neeraj Kayal, Ramprasad Saptharishi

WoLLIC 2012 *Preservation under substructures modulo bounded cores* [pdf]
(*) Abhisekh Sankaran, Bharat Adsul, Vivek Madan, Pritish Kamath, Supratik Chakraborty

CSL 2012 *Faster algorithms for alternating refinement relations* [pdf]
Krishnendu Chatterjee, Siddhesh Chaubal, Pritish Kamath

WABI 2011 *Using dominances for solving the protein family identification problem* [pdf]
(*) Noël Malod-Dognin, Mathilde Le Boudic-Jamin, Pritish Kamath, Rumen Andonov

Teaching Experience

Fall 2018 **Teaching Assistant**, MIT
6.UAR : Undergraduate Research Opportunities Program (SuperUROP)
Instructors: Profs. Dina Katabi, Piotr Indyk, Michael Watts

Spring 2017 **Teaching Assistant**, MIT
6.856 : Randomized Algorithms
Instructor: Prof. David Karger

Spring 2015 **Teaching Assistant**, MIT
6.841 : Advanced Complexity Theory
Instructor: Prof. Dana Moshkovitz

Spring 2012 **Teaching Assistant**, IIT Bombay
CS 208 : Automata Theory and Logic
Instructor: Prof. Supratik Chakraborty

Professional Service

- Invited to review papers for major conferences and journals, such as, CCC, STOC, ITCS, RANDOM and SIAM J. Computing

References

Madhu Sudan
Gordon-McKay Professor
Harvard John A. Paulson School of Engineering and Applied Sciences
✉ madhu@cs.harvard.edu

Ronitt Rubinfeld
Professor
EECS, CSAIL
Massachusetts Institute of Technology
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Csaba Szepesvári
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