Purnata Ghosal

Address	Room-204, Sabarmati Hostel IIT Madras, Chennai-600036, Tamil Nadu, India.	**Phone**	+91 9176489305
		Email	purnatag@gmail.com purnata@cse.iitm.ac.in
Date of Birth	2^{nd} May 1992		

Personal Profile

I am a PhD Scholar at Indian Institute of Technology, Madras, currently in my sixth year. I am interested in Algorithms and Complexity Theory.

Education

2014-Now PhD in Computer Science - Indian Institute of Technology, Madras

CGPA - $8.47/10$

2010-2014 Bachelor of Engineering (Hons) - Indian Institute of Engineering, Science and Technology, Shibpur

Passed with 82.71% *marks.*

2008-2010 High School Education (CBSE) - DAV Model School, Durgapur

Passed All-India Senior Secondary Certificate Examination with 95.8% *marks.*

Projects

July 2014 - Present Indian Institute of Technology, Madras
PhD (Complexity Theory)

I am studying arithmetic circuits, which are models of computation for polynomials over a field. I am interested in identity testing of special classes of multilinear circuits, and showing lower bounds against classes of arithmetic circuits both in the classical sense and parameterized by degree of the polynomial.

Jul 2013 - May 2014 Indian Institute of Engineering, Science and Technology, Shibpur
B.E Final Year Project

Comparative study of the optimal nature of final solutions obtained by using a Genetic Algorithm on the outputs of four classifier algorithms (C4.5, CN2, RISE and PRISM) on a collection of datasets versus using a reward-punishment weight assignment on the candidate solutions.

May - Jun 2013 Indian Institute of Technology, Kharagpur
Summer Intern

Implemented the adaptively improved Douglas-Peucker Algorithm for polygonal approximation of gray-scale images and compared the output with a Digital Geometric method for polygonal approximation on the same image set.

Publications

- *On Constant Depth Circuits Parameterized by Degree: Identity Testing and Depth Reduction* by Purnata Ghosal, Om Prakash, B. V. Raghavendra Rao appeared in the proceedings of the International Computing and Combinatorics Conference (COCOON) 2017, pages 250-261.
- *On Proving Parameterized Size Lower Bounds for Multilinear Algebraic Models* by Purnata Ghosal, B. V. Raghavendra Rao appeared in the proceedings of the International Computing and Combinatorics Conference (COCOON) 2019, pages 178-192.
- *A note on parameterized polynomial identity testing using hitting set generators* by Purnata Ghosal, B. V. Raghavendra Rao appeared in Information Processing Letters, Volume 151.

Talks

Mar 2016 On Derandomizing Algorithms that Err Extremely Rarely
Authors: Oded Goldreich, Avi Wigderson

Presented the paper as a Complexity Theory Meet (Cotmeet) seminar at IIT Madras.

Aug 2017 On Constant Depth Circuits Parameterized by Degree: Identity Testing and Depth Reduction
Authors: Purnata Ghosal, Om Prakash, B. V. Raghavendra Rao

Presented at the Computing and Combinatorics Conference (COCOON) 2017.

Aug 2018 Separating Monotone VP and VNP
Author: Amir Yehudayoff

Presented the paper as a Complexity Theory Meet (Cotmeet) seminar at IIT Madras.

Jan,Mar 2019 Parameterized Lower Bounds on Multilinear Algebraic Models
Authors: Purnata Ghosal, B. V. Raghavendra Rao

Presented as a Complexity Seminar at Saarland University and later at the Workshop on Algebraic Complexity Theory (WACT) 2019.

Aug 2019 Lower Bounds for sums of powers of low degree univariates
Authors: Neeraj Kayal, Pascal Koiran, Timothée Pecatte, Chandan Saha

Presented the paper as a Complexity Theory Meet (Cotmeet) seminar at IIT Madras.

Coursework and Teaching

Courses: The following are courses that I took part in, at IIT Madras. Grades are on a scale of 10:

Advanced Data Structures and Algorithms	9
Mathematical Concepts for Computer Science	9
Algorithmic Algebra	9
Advanced Theory of Computation	7
Advanced Complexity Theory	8
Modern Techniques in Theory of Computation	8
Advanced Algorithms	8
Probability and Computing	9

Teaching: I was a Teaching Assistant for the following courses:
Computational Engineering
Languages, Machines and Computation
Fundamentals of Data Science

Advanced Data Structures and Algorithms
Pseudorandomness
Logic and Combinatorics in Computer Science
Randomized Algorithms
Computability and Complexity

Software Skills and Other Achievements

- **Software**
  - Proficient in programming in *C, C++, Python 2.7, Java*
  - *Oracle Certified Web Component Developer* (J2EE 5, JSTL 1.0, Struts Framework 1.2.9)
  - *Comfortable with scripting in* LaTeX, *Comfortable with Windows and Linux environments*
- **Scholastic Achievements**
  - *Recipient of National Talent Search Scholarship by qualifying NTS Examination conducted by NCERT, Government of India.*
  - *Participated in an Oracle Certified JAVA (J2EE 5) Web Component Developing course conducted by NIIT and completed a web development project using Struts 1.2.9 framework, JSTL 1.0.*