Seshadhri Comandur

Curriculum Vitae

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Education

Princeton University 2003–2008 (expected)

Ph.D. Candidate in Computer Science

Advisor: Prof. Bernard Chazelle

My thesis involves a study of online sublinear reconstruction algorithms in combinatorial and geometric settings.

Indian Institute of Technology, Kanpur 1999–2003

B.Tech. in Computer Science and Engineering

Advisor: Prof. Manindra Agrawal

Thesis Topic : Generating Large Primes Using Cyclotomic Polynomials

Research Interests

- Sublinear Algorithms and Property Testing
- Approximation Algorithms
- Computational Geometry
- Machine Learning

One of the focal points of my research has been in designing "reconstruction" algorithms. Such an algorithm takes an input and modifies it minimally to enforce some structural property - this is done in an online fashion using only *sublinear time*. The techniques developed in these results can be used to construct sublinear-time approximation algorithms. I have worked on both combinatorial and geometric problems in this model. Furthermore, I have done work on *self-improving algorithms* - algorithms that are able to use the structure of their input distribution to optimize their running time. I have also been involved in work in *online learning*, which dealt with using sublinear techniques to get efficient learning algorithms with stronger performance guarantees.

Honors

- **Awarded *Director's Gold Medal* in the IIT Kanpur class of 2003**
  Awarded one per class of 450 students to the best all-round student
- **3rd in the IIT Kanpur class of 2003**
  With GPA of 9.9/10, placed third in a class of 450 students
- **All India rank 51 (out of about 150,000) in IIT-JEE 1999**
  Ranked 51 in the Joint Entrance Examination to the Indian Institutes of Technology
- **Scholarship in National Talent Search Examination (NTSE) 1997**
  750 students are awarded scholarships every year all over India

Publications

- **Testing Expansion in Bounded Degree Graphs** (with Satyen Kale), ECCC Technical Report TR07-076.
- **Adaptive Algorithms for Online Decision Problems** (with Elad Hazan), ECCC Technical Report TR07-088.
- **Self-Improving Algorithms for Delaunay Triangulations** (with Kenneth L. Clarkson) Accepted in 24th Symposium on Computational Geometry (SOCG 2008).
- **Parallel Monotonicity Reconstruction** (with Michael Saks), Proceedings of 19th Symposium on Discrete Algorithms (SODA 2008).
- **Online Geometric Reconstruction** (with Bernard Chazelle), Proceedings of 22nd Symposium on Computational Geometry (SOCG 2006).
  Submitted to *JACM*.
- **Self-Improving Algorithms** (with Nir Ailon, Bernard Chazelle, and Ding Liu), Proceedings of 17th Symposium on Discrete Algorithms (SODA 2006).
- **Property-Preserving Data Reconstruction** (with Nir Ailon, Bernard Chazelle, and Ding Liu), Proceedings of 15th International Symposium on Algorithms and Computation (ISAAC 2004).
  Full version to appear in *Algorithmica*
- **Estimating the Distance to a Monotone Function** (with Nir Ailon, Bernard Chazelle, and Ding Liu), Proceedings of 8th International Workshop on Randomization and Computation (RANDOM 2004).
  Full version to appear in *Random Structures and Algorithms*
- **RAM Simulation of BGS model of Abstract State Machines**, (with Anil Seth and Somenath Biswas) Proceedings of 12th International Workshop on Abstract State Machines (ASM 2005).

Invited Talks

- **Theory seminar, Computer Science Department, University of Toronto, Canada** — February 2008
  Invited talk on *Adaptive Algorithms for Online Optimization Problems*
- **Theory seminar, IBM T. J. Watson Research Center, NY** — February 2008
  Invited talk on *Adaptive Algorithms for Online Optimization Problems*
- **Theory seminar, Computer Science Department, Rutgers University, NJ** — February 2008
  Invited talk on *Parallel Monotonicity Reconstruction*
- **Theory seminar, Google, NY** — February 2008
  Invited talk on *Adaptive Algorithms for Online Optimization Problems*
- **Theory seminar, Computer Science Department, Princeton University, NJ** — February 2008
  Invited talk on *Adaptive Algorithms for Online Optimization Problems*
- **Theory seminar, Microsoft Research, WA** — December 2007
  Invited talk on *Parallel Monotonicity Reconstruction*
- **Theory seminar, IBM Almaden Research Center, CA** — August 2007
  Invited talk on *Self-Improving Algorithms*
- **Theory seminar, IBM T. J. Watson Research Center, NY** — March 2007
  Invited talk on *Online Reconstruction*
- **DIMACS Mixer Series, Rutgers University, NJ** — October 2006
  Invited talk on *Online Geometric Reconstruction*
- **Theory seminar, Computer Science Department, Princeton University, NJ** — September 2004
  Invited talk on *Estimating Distance to Monotonicity*

Teaching Experience

- **Computer Science Department, Princeton University, NJ** — Spring 2006
  Teaching Assistant for COS 451: *Computational Geometry*
- **Computer Science Department, Princeton University, NJ** — Fall 2004
  Teaching Assistant for COS 226: *Algorithms and Data Structures*

Work Experience

- **Theory Group, IBM Almaden Research Center, CA** Summer 2006
  Worked as Summer Intern

Programming Languages

C, Java

References

Prof. Bernard Chazelle
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Prof. Michael Saks
Department of Mathematics,
Rutgers University
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Email: saks@math.rutgers.edu

Dr. Kenneth L. Clarkson
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