K Prahlad Narasimhan

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kprahlad.github.io

Research Interests: Algorithmic problems involving computational geometry and graph theory. Specifically, I am currently working on visibility graphs derived from variations of the Art Gallery problem. I am also interested in approximation algorithms, parametized complexity and optimization theory.

RESEARCH EXPERIENCE

OPTIMIZATION CONSTRUCTS | NISER, Bhubaneswar
Autumn of 2020 | Under **Dr. Aritra Banik** and **Dr. Sutanu Roy**
- Worked on Linear and Semidefinite Optimization and looked at its uses in approximation of NP-Hard problems.
- As part of my 7th semester project. **Report**.

COMPUTATIONAL GEOMETRY | NISER, Bhubaneswar
Summer of 2020 | Under **Dr. Aritra Banik**

- Worked on FPT and approximation algorithms in the context of computational geometry.
- Presented my work on the Terrain Guarding problem at CALDAM-2021. **Report**.

CELLULAR AUTOMATA | IIT, Kharagpur
Summer of 2019 | Under **Dr. Dipanwita Roychowdhury**
- Worked on the cryptographic applications of Cellular Automata. Understood a seminal work [1] in this area.
- Synthesized Non-Hybrid Cellular Automata from irreducible polynomials. **Report**.

AUTOMATA THEORY | Chennai Mathematical Institute
Summer of 2018 | Under **Dr. S.P Suresh**
- An introductory reading project on the theory of automata from *"Automata and Computability"* by D. C. Kozen [2].
- Reduced the number of axioms required to define a Kleene Algebra - the algebra of regular languages, by one through the course of the year. **Report**.

PUBLICATIONS

ONE-SIDED DISCRETE TERRAIN GUARDING AND CHORDAL GRAPHS | Submitted: 3.10.2020, Accepted: 8.12.2020; Appeared in **LNCS 12601** - Algorithms and Discrete Applied Mathematics
- Proved that a restricted version of the Terrain Guarding problem is equivalent to the Clique Cover problem in Chordal Graphs, extending a result proved for orthogonal terrains in [3]. This work is a step forward in understanding the longstanding question on whether Terrain Guarding is FPT.
- **DOI** address. **Webpage** containing the PDF of the pre-print.

EDUCATION

NISER, BHUBANESWAR, HBNI
Integrated BSc., MSc.
Major in Mathematics, Minor in Computer Science.
- Duration: 2017 - 2022.
- Location: Khurda, OD, India.
- Current Semester: 8.
- Current GPA: 8.68.

FELLOWSHIPS

INSPIRE SHE - Merit based scholarship awarded by the Department of Science and Technology, Government of India which fully funds my undergraduate studies. Duration: 2017 - 2022.

IAS SRF - Merit based summer fellowship awarded by the Indian Academy of Sciences. Duration: Summer of 2019.

COURSEWORK

(Selected Few)
Graph Theory • Topology • Multi-variable Calculus • Linear Algebra • Functional Analysis • C++ • Theory of Computation • Convex Optimization • Introduction to Algorithms • Geometric Algorithms

OTHER INTERESTS

Running • Digital Art • Trekking • Photography • Cricket • Blogging

LINKS

E-Mail: **Institute ID**, **Personal ID**
Blog: **Sequence of Letters**