

# 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, parametrized 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 7<sup>th</sup> 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**