

Satya Prakash Nayak

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EDUCATION

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|----------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Max Planck Institute for Software Systems Ph.D. in Computer Science Advisor: Anne-Kathrin Schmuck | Kaiserslautern, Germany 2021–Current |
| Chennai Mathematical Institute M.Sc. in Computer Science CGPA: 9.94/10.00 | Chennai, India 2019–2021 |
| Chennai Mathematical Institute B.Sc. in Mathematics and Computer Science CGPA: 8.48/10.00 | Chennai, India 2016–2019 |

RESEARCH INTEREST

Formal verification and synthesis of cyber-physical systems
Temporal Logics, Reactive Synthesis, Game Theory

RESERACH INTERNSHIPS

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| Max Planck Institute for Software Systems / University of Liverpool with Daniel Neider and Martin Zimmermann – Adaptive Strategies for rLTL Games | Remote July - Dec 2020 |
| Aix-Marseille University with Jean-Marc Talbot – Minimization of Visibly Pushdown Automata | Marseille, France May - July 2019 |

READING PROJECTS

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| Chennai Mathematical Institute with Prajakta Nimbhorkar – Metric Embeddings and their Algorithmic Applications | Chennai, India Aug - Nov 2020 |
| Chennai Mathematical Institute with Balaguru Srivathsan – Games on Graphs | Chennai, India Aug - Nov 2019 |

ACHIEVEMENTS

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| • INSPIRE Scholarship for Higher Education | 2016–2021 |
| • Indian National Mathematics Olympiad | 2015 |
| • Zonal Informatics Olympiad, India | 2015 |
| • American Mathematics Competition 12 | 2015 |

- National Standard Examination in Astronomy, India 2015
- Regional Mathematics Olympiad, India (Gold Medalist'14) 2014, 2012

SKILLS

- **Programming Languages:** C++, Python, Haskell

TOOLS

- **CoSMo:** Contracted Strategy Mask Negotiation in two-objective parity games
- **PeSTel:** Permissive Strategy Template for generalized parity games
- **SimPA:** Sufficient Implementable Permissive Assumption for synthesis

TEACHING

- **Teaching Assistant** at Technical University of Kaiserslautern
Advanced Automata Theory 2024
Advanced Automata Theory 2023
- **Teaching Assistant** at Chennai Mathematical Institute
Discrete Mathematics 2021
Design and Analysis of Algorithms 2020
Data Mining and Machine Learning 2019
- **Guest Teacher** at Rtapalli Vidyapitha
Calculus 2017-2018

OTHER PROFESSIONAL ACTIVITIES

- **PC Member:** HSCC RE 2024
- **Conference Reviewer:** ISoLA 2022
- **Conference Sub-reviewer:** TACAS 2024, VMCAI 2024, ICSE 2023, NFM 2022

JOURNAL PUBLICATIONS

- [1] @. S. P. Nayak, D. Neider, R. Roy, and M. Zimmermann, “Robust computation tree logic”, *Innovations in Systems and Software Engineering*, 2024.
- [2] S. P. Nayak, L. N. Egidio, M. Della Rossa, A.-K. Schmuck, and R. M. Jungers, “Context-triggered abstraction-based control design”, *IEEE Open Journal of Control Systems*, vol. 2, pp. 277–296, 2023.

@. alphabetical/randomized order of authors

CONFERENCE PUBLICATIONS

- [3] @. A. Anand, A. Schmuck, and S. P. Nayak, “Contract-based distributed logical controller synthesis”, in *Proceedings of the 27th ACM International Conference on Hybrid Systems: Computation and Control, HSCC 2024*, 2024.
- [4] @. S. P. Nayak and A. Schmuck, “Most general winning secure equilibria synthesis in graph games”, in *Tools and Algorithms for the Construction and Analysis of Systems - 30th International Conference, TACAS 2024*, 2024.

- [5] A. Nejati, S. P. Nayak, and A. Schmuck, “Context-triggered games for reactive synthesis over stochastic systems via control barrier certificates”, in *Proceedings of the 27th ACM International Conference on Hybrid Systems: Computation and Control, HSCC 2024*, 2024.
- [6] @. A. Schmuck, K. S. Thejaswini, I. Saglam, and S. P. Nayak, “Solving two-player games under progress assumptions”, in *Verification, Model Checking, and Abstract Interpretation - 25th International Conference, VMCAI 2024, London, United Kingdom, January 15-16, 2024, Proceedings, Part I*, R. Dimitrova, O. Lahav, and S. Wolff, Eds., ser. Lecture Notes in Computer Science, vol. 14499, Springer, 2024, pp. 208–231.
- [7] @. A. Anand, K. Mallik, S. P. Nayak, and A. Schmuck, “Computing adequately permissive assumptions for synthesis”, in *Tools and Algorithms for the Construction and Analysis of Systems - 29th International Conference, TACAS 2023, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2023, Paris, France, April 22-27, 2023, Proceedings, Part II*, S. Sankaranarayanan and N. Sharygina, Eds., ser. Lecture Notes in Computer Science, vol. 13994, Springer, 2023, pp. 211–228.
- [8] @. A. Anand, S. P. Nayak, and A. Schmuck, “Synthesizing permissive winning strategy templates for parity games”, in *Computer Aided Verification - 35th International Conference, CAV 2023, Paris, France, July 17-22, 2023, Proceedings, Part I*, C. Enea and A. Lal, Eds., ser. Lecture Notes in Computer Science, vol. 13964, Springer, 2023, pp. 436–458.
- [9] @. S. P. Nayak, D. Neider, R. Roy, and M. Zimmermann, “Robust computation tree logic”, in *NASA Formal Methods - 14th International Symposium, NFM 2022, Pasadena, CA, USA, May 24-27, 2022, Proceedings*, J. V. Deshmukh, K. Havelund, and I. Perez, Eds., ser. Lecture Notes in Computer Science, vol. 13260, Springer, 2022, pp. 538–556.
- [10] @. S. P. Nayak, D. Neider, and M. Zimmermann, “Robustness-by-construction synthesis: Adapting to the environment at runtime”, in *Leveraging Applications of Formal Methods, Verification and Validation. Verification Principles - 11th International Symposium, ISoLA 2022, Rhodes, Greece, October 22-30, 2022, Proceedings, Part I*, T. Margaria and B. Steffen, Eds., ser. Lecture Notes in Computer Science, vol. 13701, Springer, 2022, pp. 149–173.

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