SUBIN PULARI

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PROFESSIONAL EXPERIENCE

CNRS Postdoctoral Researcher *October 2024 - Present*
LaBRI, Université de Bordeaux

Senior Project Associate *June 2024 - September 2024*
Department of Computer Science and Engineering, Indian Institute of Technology Kanpur

EDUCATION

Indian Institute of Technology Kanpur *July 2018 - June 2024*
Ph.D. & Master of Technology (M.Tech) in Computer Science and Engineering CPI: 10/10
Department of Computer Science and Engineering
Advisors: Dr.Satyadev Nandakumar and Dr.Sunil Simon

National Institute of Technology Calicut *July 2014 - May 2018*
Bachelor of Technology (B.Tech) in Computer Science and Engineering CGPA: 9.53/10
Department of Computer Science and Engineering

RESEARCH INTERESTS

- Algorithmic Information Theory.
- Computational Complexity Theory.
- Meta-complexity and Pseudorandomness.
- Computability and Complexity in Analysis.
- Ergodic Theory and Symbolic Dynamical Systems.
- Effective Fractal Dimension and Finite-State Dimension.

PUBLICATIONS

1. **Point-to-set Principle and Constructive Dimension Faithfulness** (with Satyadev Nandakumar and Akhil S), *49th International Symposium on Mathematical Foundations of Computer Science (MFCS) 2024 , Bratislava, Slovakia.*
2. **Finite-state relative dimension, dimensions of A. P. subsequences and a finite-state van Lambalgen's theorem** (joint work with Satyadev Nandakumar and Akhil S), *Information and Computation , Volume 298, June 2024, 105156.*
3. **A Weyl Criterion for Finite-State Dimension and Applications** (joint work with Jack H. Lutz and Satyadev Nandakumar), *48th International Symposium on Mathematical Foundations of Computer Science (MFCS) 2023 , Bordeaux, France.*
4. **Real numbers equally compressible in every base**, (with Satyadev Nandakumar), *40th International Symposium on Theoretical Aspects of Computer Science (STACS) 2023, Hamburg, Germany, 2023.*
5. **Finite-State Relative Dimension and the Dimensions of AP Subsequences**, (with Satyadev Nandakumar and Akhil S), *The 17th Annual Conference on Theory and Applications of Models of Computation (TAMC) 2022, Tianjin, China.*

6. **Ergodic Theorems and Converses for PSPACE Functions**,(with Satyadev Nandakumar), *Theory of Computing Systems (2022).*

7. **Ergodic Theorems for PSPACE functions and their converses**, (with Satyadev Nandakumar), *46th International Symposium on the Mathematical Foundations of Computer Science (MFCS) 2021, Tallinn, Estonia.*

8. **An analogue of Pillai's theorem for continued fraction normality and an application to subsequences** (with Satyadev Nandakumar, Prateek Vishnoi and Gopal Viswanathan), *Bulletin of the London Mathematical Society, Volume 53, Issue 5, October 2021, Pages 1414-1428.*

PREPRINTS

1. **One-Way Functions and Polynomial Time Dimension** (with Satyadev Nandakumar, Akhil S and Suronjona Sarma), *ArXiv : https://arxiv.org/abs/2411.02392.*

2. **The Agafonov and Schnorr-Stimm theorems for probabilistic automata** (with Laurent Bienvenu and Hugo Gimbert), *ArXiv : https://arxiv.org/abs/2502.12307.*

RESEARCH VISITS

Tata Institute of Fundamental Research, Mumbai May 2018 - July 2018
Visiting Students' Research Programme (VSRP 2018)

· Research supervised by Dr.Piyush Srivastava, Reader, School of Technology and Computer Science, TIFR, Mumbai.

Indian Institute of Technology Kanpur May 2017 - July 2017
Students-Undergraduate Research Graduate Excellence (SURGE 2017)

· Research supervised by Dr.Satyadev Nandakumar, Associate Professor, CSED, IITK.

WORKSHOPS ATTENDED

IMS Graduate Summer School in Logic July 2022

· Summer School in Mathematical Logic at Institute of Mathematical Sciences (IMS), National University of Singapore.

CSA50 - Pratiksha Trust Workshop on Theoretical Computer Science January 2019

· Venue: Indian Institute of Science, Bangalore, India

TEACHING EXPERIENCE

Graduate Teaching Assistantship IIT Kanpur

· Principles of Programming Languages (2018 and 2019)
· Computer Organization (2018)
· Algorithmic Information Theory (2019)
· Theory of Computation (2020)
· Mathematics for Computer Science (2020 and 2021)
· Computational Complexity (2021)
· Quantum Computing (2022)

INVITED TALKS

1. **Automates Seminar, Institut de Recherche en Informatique Fondamentale (IRIF), Paris (17 January 2025)**, *On the Compressibility of Real Numbers: New insights using exponential sums.*
2. **Logic Seminar, Department of Mathematics, National University of Singapore (5 March 2025)**,*On the Compressibility of Real Numbers: New insights using exponential sums*
3. **Séminaire Algorithmique, Groupe de recherche en informatique, image et instrumentation de Caen (GREYC), Caen (11 March 2025)**, *A Duality Between One-Way Functions and Non-Robustness of Polynomial Time Dimension*

SEMINAR AND CONFERENCE TALKS

1. **On the Compressibility of Real Numbers: Certain insights using Fourier analytic methods**, *M2F Seminar, LaBRI, Université de Bordeaux (12 November 2024).*
2. **A Weyl Criterion for Finite-State Dimension and Applications** , *48th International Symposium on Mathematical Foundations of Computer Science (MFCS) 2023, Bordeaux, France (August 29 2023).*
3. **Real numbers equally compressible in every base**, *40th International Symposium on Theoretical Aspects of Computer Science (STACS) 2023, Hamburg, Germany, (March 9 2023).*

REPORTS / DISSERTATIONS

On resource bounded ergodic theorems and the utility of exponential sums in Algorithmic Information Theory
PhD Thesis (IIT Kanpur)

· Supervised by Dr. Satyadev Nandakumar and Dr. Sunil Simon

On certain applications of Fourier Analysis in the theory of Finite-State Dimension
MTech Thesis (IIT Kanpur)

· Supervised by Dr. Satyadev Nandakumar and Dr. Sunil Simon

On Finite State Ergodic Markov Chains
B.Tech Major Project (NIT Calicut)

· Supervised by Dr. K. Murali Krishnan

ACADEMIC HONORS AND AWARDS

- Gold Medal for the highest CGPA in Bachelor of Technology (B.Tech) Computer Science and Engineering 2018, National Institute of Technology Calicut.
- Best Student Project Award 2018 by Tata Consultancy Services Limited (TCS) for the B.Tech project titled *On Finite State Ergodic Markov Chains.*
- Best Project Award in B.Tech Computer Science and Engineering 2018 by C.R.E.C. Parent Teacher Association, National Institute of Technology Calicut for the B.Tech project titled *On Finite State Ergodic Markov Chains.*

REFERENCES

Available upon request.