




# Atanu Kundu

Senior Research Fellow, Indian Association for the Cultivation of Sciences.  
Kolkata, India.


 Gmail  Twitter  LinkedIn  GitLab  
 Google scholar  atanucs.github.io






## Education

- 2020 – continue  **Ph.D. in Computer Science from IACS Kolkata India.**  
Thesis title: *Algorithms for detecting unsafe behavior in CPS design.*
- 2016 – 2018  **M.Sc. in Computer Science from Visva-Bharati, India.**
- 2013 – 2016  **B.Sc. in Computer Science from The University of Burdwan.**






## Research Publications

- 1 A. Kundu, S. Das, and R. Ray, “Sat-reach: A bounded model checker for affine hybrid systems,” *ACM Trans. Embed. Comput. Syst.*, vol. 22, no. 2, Jan. 2023, ISSN: 1539-9087.  DOI: 10.1145/3567425.
- 2 L. Bu, G. Frehse, A. Kundu, R. Ray, Y. Shi, and E. Zaffanella, “Arch-comp22 category report: Hybrid systems with piecewise constant dynamics and bounded model checking,” in *Proceedings of 9th International Workshop on Applied*, vol. 90, 2022, pp. 44–57.

## Projects and Work Experiences


- 2017 - May 2018  Relay TCP over wireless network with free-space optical and worldwide interoperability for microwave access.  
*under the supervision of Mr. Subhasis Banerjee, Visva-Bharati, India.*
- Jan - Jun 2020  SatG: a path planner for robots in a 2D grid.  
*Under the supervision of Dr. Ansuman Banerjee, ISI Kolkata, India.*  
SatG is developed based on SAT-based graph encoding. It handles multiple robot configurations. At the same time, SATG generates SMT-LIB2 constraints for obtaining a plan.
- May - Dec 2022  Building neural network models of the standard Cyber-Physical Systems (CPS) benchmarks.  
*Under the supervision of Dr. Rajarshi Ray, IACS Kolkata, India.*  
Building Feed-forward Neural Networks (FNNs) for CPS benchmarks such as hybrid automata and Simulink models. These models are the approximation of the original models and can be useful in developing the application of such systems. We built FNN models for such systems with non-deterministic behavior and time-varying input signal.

## Skills

- Languages  Native language Bengali. Fluent in English, Hindi.
- Coding  Proficient in C, C++, Python, SMT-LIB2. Familiar with LaTeX.
- DevOps  Experience in git and Docker.
- Tools  XSpeed, SAT-Reach, SpaceEx, Flow\*, dReach, DNNF, and DNNV.
- Misc.  Academic research, teaching, training, consultation, LaTeX typesetting, and publishing.

## Teaching Experiences



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- Spring 2022      Teaching assistance on Artificial Intelligence (COM 4211)  
Responsibilities included setting and evaluating lab assignments. Supervising students throughout the course to succeed in the lab assignments.

## Miscellaneous Experience

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### Invited Talks

- 2022      **SAT-Reach: A Bounded Model Checker for Affine Hybrid Systems** presented in formal methods update meeting 2022 at IIT Delhi.
- 2023      A short presentation titled **A Framework for Detecting Unsafe Behaviour in Cyber-Physical Systems** presented in Tech Symposium on Computing Trends 2023, organized by THALES associated with UNIVERSITY OF CALCUTTA.

### Certification

-  **Special recognition for completing a short thesis presentation in exactly 5 minutes.**  
Awarded by THALES associated with UNIVERSITY OF CALCUTTA.