




# Atanu Kundu

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## 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. Gon, and R. Ray, “Data-driven falsification of cyber-physical systems,” in *Proceedings of the 17th Innovations in Software Engineering Conference*, ser. ISEC '24, , Bangalore, India, Association for Computing Machinery, 2024, ISBN: 9798400717673.  DOI: 10.1145/3641399.3641401.
- 2 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.
- 3 C. Menghi, P. Arcaini, A. Kundu, *et al.*, “Arch-comp23 category report: Falsification,” in *Proceedings of 10th International Workshop on Applied Verification of Continuous and Hybrid Systems (ARCH23)*, G. Frehse and M. Althoff, Eds., ser. EPiC Series in Computing, vol. 96, EasyChair, 2023, pp. 151–169.  DOI: 10.29007/6nqs.
- 4 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.  DOI: 10.29007/lznzf.

## 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. We built FNN models for systems with non-deterministic behavior and time-varying input signals. These models are the approximation of the original models and can be useful in developing the application of such systems.

## Skills

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- Languages    🔖 Native language Bengali. Fluent in English, Hindi.
- Coding       🔖 Proficient in C, C++, Python, SMT-LIB2. Familiar with MATLAB and 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.
- Autumn 2023   🔖 Teaching assistance on Object-Oriented Programming with C++ Lab (COM 4111)  
My duties involved creating and assessing assignments and surprise tests. Additionally, I was responsible for overseeing student's progress during the course, ensuring their success in laboratory assignments.

## Miscellaneous Experience

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### Invited Talks

- 2024    🔖 Research paper **Data-driven Falsification of Cyber-physical Systems** accepted at ISEC 2024 and presented the paper IIIT Bangalore.
- 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.
- 2022    🔖 **SAT-Reach: A Bounded Model Checker for Affine Hybrid Systems** presented in formal methods update meeting 2022 at IIT Delhi.

### Certification

- 2023    🔖 **Special recognition for completing a short thesis presentation in exactly 5 minutes.** Awarded by THALES associated with UNIVERSITY OF CALCUTTA.