

# Oyendrila Dobe



 My LinkedIn profile

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 My publications

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 My homepage

## Research Interests

My main research interest lies in the formal verification of systems concerning system-level properties called hyperproperties. I am seeking opportunities to learn and contribute to projects involving the design and implementation of algorithms that ensure security, correctness, fairness, and privacy guarantees of systems based on formal reasoning.

## Education

- 2020 – Current
- ▶ **Ph.D. in Computer Science** (Expected: April 2024)  
Michigan State University *East Lansing, USA*  
Thesis title: *Verification of Probabilistic Hyperproperties on Markov models.*  
Advisor: *Prof. Borzoo Bonakdarpour.*  
Started in Iowa State University in August 2018 and transferred to MSU.
- 2013 – 2017
- ▶ **B.Tech. in Computer Science and Engineering**  
Maulana Abul Kalam Azad Univerisity of Technology *Kolkata, India*  
Thesis title: *Detection and Extraction of Tumor from Brain MRI scans.*  
Advisor: *Amiya Halder.*

## Work Experience

- Summer 2023
- ▶ **Applied Scientist Intern**  
Dafny, Amazon Web Services *Seattle, USA*
    - **Project Manager:** *Aaron Tomb*; **Mentor:** *Rustan Leino*
    - Extended a prototype tool that checks for program equivalence of methods across different languages.
- Summer 2022
- ▶ **Applied Scientist Intern**  
Privacy Engineering, Amazon Web Services *New York, USA*
    - **Project Manager:** *Temesghen Kahsai*; **Mentor:** *Byron Cook*
    - Built a prototype tool to detect data residency violations in customers' cloud setup.
- 2018-2022
- ▶ **Teaching Assistant**  
Courses Taught: Object-Oriented Programming, Data Structures, Discrete Math
    - Conducted recitations, and office hours to help students improve their understanding.
    - Lead TA for Fall 2022 for a class of 194 students.
- Summer 2019
- ▶ **Research Assistant under Dr. Wei Le**  
Program Analysis Laboratory *Ames, USA*
    - Built case studies to prove the applicability of demand-driven algorithm to generate minimum size executable of C++/C codes, from given program lines of large projects.
    - Wrote Python scripts to automate testing across docker containers and VM.

## Work Experience (continued)

- 2017-2018    ▶ **System Engineer**  
Infosys Limited Mysuru, India
- Underwent rigorous training in object-oriented programming in Python, and SAP ABAP.
  - Solely handled the implementation of leave system for a new subsidiary of the company using ABAP, directly under team-lead.
- Summer 2017    ▶ **Research Assistant**  
Istaka Consulting Remote
- Conducted research on profiles of leading leadership coaches to form discussion agendas for one-on-one meetings.
  - Summarized and organized meeting notes, and assisted in website and presentation creation.

## Research Publications

- 1 **O. Dobe**, S. Schupp, E. Bartocci, *et al.*, “Lightweight verification of hyperproperties,” in *Automated Technology for Verification and Analysis*, É. André and J. Sun, Eds., Cham: Springer Nature Switzerland, 2023, pp. 3–25, ISBN: 978-3-031-45332-8. [DOI: https://doi.org/10.1007/978-3-031-45332-8\\_1](https://doi.org/10.1007/978-3-031-45332-8_1).
- 2 L. Gerlach, **O. Dobe**, E. Abraham, E. Bartocci, and B. Bonakdarpour, “Introducing asynchronicity to probabilistic hyperproperties,” in *Quantitative Evaluation of Systems*, N. Jansen and M. Tribastone, Eds., Cham: Springer Nature Switzerland, 2023, pp. 47–64, ISBN: 978-3-031-43835-6. [DOI: https://doi.org/10.1007/978-3-031-43835-6\\_4](https://doi.org/10.1007/978-3-031-43835-6_4).
- 3 **O. Dobe**, E. Abraham, E. Bartocci, and B. Bonakdarpour, “Model checking hyperproperties for markov decision processes,” *Information and Computation*, vol. 289, p. 104 978, 2022, Special Issue on 11th Int. Symp. on Games, Automata, Logics and Formal Verification, ISSN: 0890-5401. [DOI: https://doi.org/10.1016/j.ic.2022.104978](https://doi.org/10.1016/j.ic.2022.104978).
- 4 **O. Dobe**, L. Wilke, E. Abraham, E. Bartocci, and B. Bonakdarpour, “Probabilistic hyperproperties with rewards,” in *NASA Formal Methods*, J. V. Deshmukh, K. Havelund, and I. Perez, Eds., Cham: Springer International Publishing, 2022, pp. 656–673, ISBN: 978-3-031-06773-0. [DOI: https://doi.org/10.1007/978-3-031-06773-0\\_35](https://doi.org/10.1007/978-3-031-06773-0_35).
- 5 **O. Dobe**, E. Abraham, E. Bartocci, and B. Bonakdarpour, “Hyperprob: A model checker for probabilistic hyperproperties,” in *Formal Methods*, M. Huisman, C. Păsăreanu, and N. Zhan, Eds., Cham: Springer International Publishing, 2021, pp. 657–666, ISBN: 978-3-030-90870-6. [DOI: https://doi.org/10.1007/978-3-030-90870-6\\_35](https://doi.org/10.1007/978-3-030-90870-6_35).
- 6 E. Abraham, E. Bartocci, B. Bonakdarpour, and **O. Dobe**, “Parameter synthesis for probabilistic hyperproperties,” in *LPAR23. LPAR-23: 23rd International Conference on Logic for Programming, Artificial Intelligence and Reasoning*, E. Albert and L. Kovacs, Eds., ser. EPiC Series in Computing, vol. 73, EasyChair, 2020, pp. 12–31. [DOI: 10.29007/37lf](https://doi.org/10.29007/37lf).
- 7 E. Abraham, E. Bartocci, B. Bonakdarpour, and **O. Dobe**, “Probabilistic hyperproperties with nondeterminism,” in *Automated Technology for Verification and Analysis*, D. V. Hung and O. Sokolsky, Eds., Cham: Springer International Publishing, 2020, pp. 518–534, ISBN: 978-3-030-59152-6. [DOI: https://doi.org/10.1007/978-3-030-59152-6\\_29](https://doi.org/10.1007/978-3-030-59152-6_29).
- 8 **O. Dobe**, A. Sarkar, and A. Halder, “Rough k-means and morphological operation-based brain tumor extraction,” in *Integrated Intelligent Computing, Communication and Security*, A. Krishna, K. Srikantaiah, and C. Naveena, Eds. Singapore: Springer Singapore, 2019, pp. 661–667, ISBN: 978-981-10-8797-4. [DOI: 10.1007/978-981-10-8797-4\\_67](https://doi.org/10.1007/978-981-10-8797-4_67).

- 9 A. Halder and O. Dobe, "Rough k-means and support vector machine based brain tumor detection," in *2017 International Conference on Advances in Computing, Communications and Informatics (ICACCI)*, 2017, pp. 116–120. DOI: [10.1109/ICACCI.2017.8125826](https://doi.org/10.1109/ICACCI.2017.8125826).
- 10 A. Halder and O. Dobe, "Detection of tumor in brain mri using fuzzy feature selection and support vector machine," in *2016 International Conference on Advances in Computing, Communications and Informatics (ICACCI)*, 2016, pp. 1919–1923. DOI: [10.1109/ICACCI.2016.7732331](https://doi.org/10.1109/ICACCI.2016.7732331).

## Miscellaneous Experience

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### Awards and Achievements

- 2021 ▶ *Grace Hopper Scholar*
- Summer 2021 ▶ *University Graduate Research Fellowship*, Michigan State University
- 2021 ▶ *Student Attendance Grant*, CAV 2021
- ▶ *Gold medal in Iowa Badminton Open*, Tier-B in women's singles category
- 2019 ▶ *Grace Hopper Scholar*
- ▶ *Silver medal in Iowa Badminton Open*, Tier-B in women's doubles category
- ▶ *Bronze medal in Iowa Badminton Open*, Tier-B in women's singles singles
- ▶ *Gold medal in Nebraska Badminton Open*, Tier-B in women's doubles category

### Volunteer Service

- 2021-current ▶ Serving as graduate advisor for [MSU's Spartan Coding clubs](#)
- 2023-2024 ▶ Mentor, Departmental mentoring programs for early-stage graduate students
- 2024 ▶ Artifact Evaluator, *CAV 2024*
- ▶ Subreviewer, *CAV 2024*
- 2023 ▶ Artifact Evaluator, *TACAS 2024*
- ▶ Artifact Evaluator, *QEST 2023*
- ▶ Subreviewer, *VSTTE 2023*
- 2022 ▶ Artifact Evaluator, *PLDI 2023*
- ▶ Subreviewer, *NFM 2022*
- ▶ Artifact Evaluator, *QEST 2022*
- ▶ Subreviewer, *QEST 2022*
- ▶ Subreviewer, *DISC 2022*
- ▶ Graduate representative in Departmental Graduate studies and research committee
- 2021 ▶ Subreviewer, *ATVA 2021*
- ▶ Graduate representative in Departmental Meeting Committee

## References

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Available on Request