Nandini Banerjee

Mishawaka, IN | nbanerje@nd.edu | Website | LinkedIn

Education

PhD in Computer Science and Engineering Expected May 2028
University of Notre Dame
Notre Dame, IN

Bachelor of Technology in Computer Science and Engineering May 2019
SRM Institute of Science and Technology
Kattankulathur, India

Research Experience

Graduate Research Assistant Aug 2022 – Present
University of Notre Dame
Advisor: Assistant Professor Diego Gómez-Zará

- Conducted empirical research, analyzing large-scale datasets on scientific publications (SciSciNet) and patents (USPTO) using Python to uncover insights into the relationship between scientific team gender composition and the occurrence of disruptive breakthroughs.
- Applied statistical and machine learning techniques and transformer-based models using Python to analyze the effects of team gender composition on the disruptiveness of the research output.

Undergraduate Research Intern Dec 2017, Dec 2018 - July 2019
Indian Institute of Engineering Science and Technology
Advisor: Professor Biplab Kumar Sikdar

- Implemented a novel method in Python that exploited the AES algorithm to leak the secret encryption key resulting in a publication in the Microelectronics Journal.
- Developed skills in designing microprocessor-based systems through practical internship projects.

Teaching Experience

Graduate Teaching Assistant — Data Science (CSE 40647) Spring 2026
University of Notre Dame
Instructor: Prof. Diego Gómez-Zará

- Designed assignments carefully engineered to remain meaningful in the age of generative AI: built around large datasets that cannot be uploaded to a chatbot, with evaluation framed around justifying decisions, such as selection of algorithm, feature, or model, rather than optimizing for a single correct answer.
- Taught full class sessions covering theory and live coding in the instructor's absence.

- Held office hours, guided group projects, and graded assignments.

Graduate Teaching Assistant — Operating System Principles (CSE 30341) Spring 2023
University of Notre Dame
Instructor: Prof. Aaron Striegel

- Supported junior undergraduates in refining advanced skills including debugging strategies, version control, and project documentation.
- Held office hours, graded assignments, and provided individualized feedback.

Graduate Teaching Assistant — Principles of Computing (CSE 10001) Fall 2022
University of Notre Dame
Instructor: Prof. Shreya Kumar

- Held office hours for non-engineering students encountering Python programming for the first time, building from first principles and ensuring foundational understanding before moving on.
- Graded assignments and provided individualized feedback.

Mentorship

Undergraduate Research Mentor Spring 2024, Fall 2024
University of Notre Dame

- Mentored two undergraduate researchers across two academic semesters, guiding them through big data pipelines, network computation, statistical inference, and visualization.
- Supported mentees in developing independent research skills and contributing to ongoing group projects.

Informal Career Advisor 2022 – Present
University of Notre Dame

- Advise students navigating post-graduation decisions, drawing on personal experience weighing academic and industry paths.

Professional Experience

Systems Engineer July 2019 – Sep 2021
Tata Consultancy Services, Hyderabad, India

- As a Full Stack Developer, used AngularJS and Spring Boot to upgrade the e-commerce merchant payments interface from legacy software resulting in improved functionality, user experience, and scalability.
- Used AngularJS to integrate a third-party payment processing software into the application, enhancing customer convenience and expanding payment flexibility.

Publications

- **Banerjee, N.**, Gomez-Zara, D. "Female-Led Teams Drive More Breakthrough Ideas in Science and Innovation." (Under peer review)

- Almutairi, M., Chiang, C., Guo, H., Belcher, M., **Banerjee, N.**, Milkowski, M., Volkova, S., Nguyen, D., Weninger, T., Yankoski, M. G., III, Ford, T. W., Gómez-Zará, D. "VIRT-LAB: An AI-Powered System for Flexible, Customizable, and Large-scale Team Simulations." Adjunct Proceedings of the 38th Annual ACM Symposium on User Interface Software and Technology (UIST Adjunct), **2025**.

- Volkova, S., Nguyen, D., Penafiel, L., Kao, H., Cohen, M., Engberson, G., Cassani, L., Ford, T., Yankoski, M., Almutairi, M., Chiang, C., **Banerjee, N.**, Belcher, M., Weninger, T., Gomez-Zara, D., Rebensky, S. "VirtLab: Augmented Intelligence for Training and Evaluating Human-AI Team Dynamics through Digital Twin Interactions." Adaptive Instructional Systems, HCII, **2025**.

- Das, N., Sen, R., Ray, D., **Banerjee, N.**, Halder, J., Tenhunen, H., Sikdar, B. K. "A trojan framework in AES core to evade state-of-the-art HT detection schemes." Microelectronics Journal, Volume 111, **2021**.

- Sandhia, G.K., **Banerjee, N.** "Survey on Hardware Detection Techniques." SRM Institute of Science and Technology International Conference on Internet of Things, **2019**.

Presentations

- "All-Female Teams Produce More Disruptive Work: Evidence from Scientific Paper." International Conference on Computational Social Science, Philadelphia, PA, **2024**.

- "All-Female Teams Produce More Disruptive Work: Evidence from Scientific Paper." International Conference on the Science of Science & Innovation, Washington, D.C., **2024**.

- "All-Female Teams Produce More Disruptive Work: Evidence from Scientific Papers." Networks in Science of Science Workshop at NetSci, Quebec, Canada, **2024**.

Awards

2024-2026	Lucy Graduate Scholar at the Lucy Family Institute for Data & Society, University of Notre Dame
2022	Selected as Kummer Innovation and Entrepreneurship (I&E) Doctoral Fellowship

Professional Development & Funding

2026	**First-Year Engineering Teaching Apprenticeship Program**, University of Notre Dame

2025 **Downes Memorial Fund**, University of Notre Dame
$1,000 awarded for Santa Fe Institute Complex Systems Summer School participation.

2025 **Notre Dame Scientific Artificial Intelligence (SAI) Graduate Fellowship**, University of Notre Dame

2025 **Quad Fellowship**

2024 **Zahm Professional Development Fund**, University of Notre Dame
$750 awarded for International Conference on Computational Social Science presentation.

2024 **Graduate Student Government Conference Presentation Grant**, University of Notre Dame
$400 awarded for International Conference on the Science of Science and Innovation presentation.

2023 **Downes Memorial Fund**, University of Notre Dame
$200 awarded for International Conference on the Science of Science and Innovation attendance.

Conferences & Events

- Complex Systems Summer School, Santa Fe Institute, Santa Fe, NM, 2025. (Participant)
- Organizational Communication Mini Conference, Chicago, IL, 2024. (Presenter)
- Summer Institute in Computational Social Science, Chicago, IL, 2024. (Participant)
- International Conference on Computational Social Science, Philadelphia, PA, 2024. (Presenter)
- International Conference on the Science of Science and Innovation, Washington, DC, 2024. (Presenter)
- International Conference on the Science of Science and Innovation, Chicago, IL, 2023. (Attendee)