

Geetanjali Bihani

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EDUCATION

- Purdue University, West Lafayette, USA** 2020 – 2025 (*Expected*)
Ph.D. in Computer and Information Technology (GPA - 3.82)
Research Interests: Reliability in LLMs, Lexical Semantics, Text Representations
- Purdue University, West Lafayette, USA** 2018 – 2020
M.S. in Computer and Information Technology (GPA - 3.69)
Thesis: Longitudinal Comparison of Word Associations in Shallow Word Embeddings [\[link\]](#)
- Delhi Technological University, Delhi, India** 2012 – 2016
B.Tech. in Electronics and Communications Engineering

FELLOWSHIPS & ASSISTANTSHIPS

- 2022 – Current **Research Assistantship** funded through U.S. Department of Justice Award (15PJDP-22-GK-03107-MECP). **Title:** *Live-streaming Offender Network-based Chat Analysis Triage Tool (LION-CATT)*. **Contribution:** Develop methods to flag online predatory intents using Large Language Models (LLMs). **Advisor:** Julia Taylor Rayz.
- 2021 – 2022 **Ross-Lynn Graduate Student Fellowship** (*previously Purdue Research Foundation (PRF) Fellowship*). **Title:** *Steganographic Approaches using Natural Language* **Contribution:** Wrote the proposal in its entirety; conducted research on natural language steganography using language model (LM) embeddings. **Mentor:** Julia Taylor Rayz.
- 2020 – 2021 **Research Assistantship** funded through NSF Smart & Connected Communities Grant (1737591). **Title:** *Sociotechnical Systems to Enable Smart and Connected Energy-Aware Residential Communities* **Contribution:** Researched multi-intent classification to address intent ambiguity in natural language utterances. **Advisor:** Julia Taylor Rayz.
- 2019 **Research Assistantship** funded through NSF I-Corps Team National Award (1932343). **Title:** *Decision Support Tool to Assess Distributed Electricity Needs* **Contribution:** Participated in the NSF I-Corps program, conducted customer discovery with over a hundred stakeholders in three months to define cost models and revenue streams. **Advisor:** Lisa Bosman.
- 2018 – 2019 **Research Assistantship** funded through Purdue Polytechnic Institute Charrette Research Award. **Title:** *Decision Support Tool to Assess Distributed Electricity Needs* **Contribution:** Developed real-time data workflow for solar energy in three U.S. locations, analyzed grid impacts through time series modeling, and performed sensitivity analysis on solar and net metering data. **Advisor:** Lisa Bosman.

TRAVEL GRANTS

- Holistic Safety and Security Research Travel Grant. Amount:** \$250 2023
- CIT Research Travel Grant Award, Purdue CIT. Amount:** \$400 2022
- Dean's Graduate Student Travel Grant. Amount:** \$250 2022
- Purdue Graduate Student Government Travel Grant. Amount:** \$500 2022
- Holistic Safety and Security Research Travel Grant. Amount:** \$250 2022

HONORS AND AWARDS

- Honorable Mention for Student Paper at NAFIPS 2023** 2023
- Best Student Poster (runner-up) PPI Holistic Safety and Security Research Impact Area. Amount:** \$250 2022
- Ross-Lynn Graduate Student Fellowship, Purdue Research Foundation.** 2021
- Second Position, PPI Holistic Safety and Security Student Presentation Competition** 2021
- National Science Foundation (NSF) I-Corps Teams National Award** 2019

PUBLICATIONS

- **Jan. 2024 - Geetanjali Bihani**, Julia Taylor Rayz. Learning Shortcuts: On the Misleading Promise of NLU in Language Models. *Proceedings of the 57th Hawaii International Conference on System Sciences (HICSS-57)* [preprint]
- **May. 2023 - Geetanjali Bihani**, Julia Taylor Rayz. Calibration Error Estimation Using Fuzzy Binning. *Fuzzy Information Processing 2023 (NAFIPS 2023), Lecture Notes in Networks and Systems, vol 751. Springer, Cham.* [paper]
- **Apr. 2022 - Geetanjali Bihani**, Julia Taylor Rayz. On Information Hiding in Natural Language Systems. *The International FLAIRS Conference Proceedings, 35.* [paper]
- **Aug. 2022 - Huijeong Kim, Sangwoo Ham, Marlen Promann, Hemanth Devarapalli, Geetanjali Bihani, Tatiana Ringenberge, Vanessa Kwarteng, Ilias Bilonis, James E. Braun, Julia Taylor Rayz, Leigh Raymond, Torsten Reimer, Panagiota Karava.** MySmartE – An eco-feedback and gaming platform to promote energy conserving thermostat-adjustment behaviors in multi-unit residential buildings. *Building and Environment, 109252.* [paper]
- **Jun. 2022 - Geetanjali Bihani.** Interpretable Privacy Preservation of Text Representations Using Vector Steganography. *Proceedings of the Thirty-Fifth AAAI Conference on Artificial Intelligence.* [paper]
- **Jun. 2021 - Geetanjali Bihani**, Julia Taylor Rayz. Low Anisotropy Sense Retrofitting (LAsER) : Towards Isotropic and Sense Enriched Representations. *Proceedings of Deep Learning Inside Out (DeeLIO): The 2nd Workshop on Knowledge Extraction and Integration for Deep Learning Architectures, NAACL 2021.* [paper]
- **Jul. 2021 - Geetanjali Bihani**, Julia Taylor Rayz. Fuzzy Classification of Multi-intent Utterances. *Proceedings of the Annual Conference of the North American Fuzzy Information Processing Society.* [paper]
- **Dec. 2020 - Geetanjali Bihani**, Julia Taylor Rayz. Model Choices Influence Attributive Word Associations: A Semi-supervised Analysis of Static Word Embeddings. *Proceedings of the 2020 IEEE/WIC/ACM International Joint Conference on Web Intelligence and Intelligent Agent Technology.* [paper]

POSTERS

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|--------------------|---|
| Spring 2023 | <i>Text Augmentation: Improving Classification Accuracy at the Expense of Calibration?</i>
CERIAS Security Symposium |
| Spring 2022 | <i>Interpretable Privacy Preservation of Text Representations Using Vector Steganography.</i>
Thirty-Fifth AAAI Conference on Artificial Intelligence |
| Spring 2022 | <i>Permutation-based Privacy in Text Vectors.</i>
CERIAS Security Symposium |
| Spring 2021 | <i>Low Anisotropy Sense Retrofitting (LAsER): Towards Isotropic and Sense Enriched Representations.</i>
The 2nd Workshop on Knowledge Extraction and Integration for Deep Learning Architectures, NAACL 2021 |
| Fall 2018 | <i>How Weather Stations can be Used to Estimate Photovoltaic (PV) Energy Impacts to the Grid.</i>
Michigan Institute for Data Science (MIDAS) Symposium |
| Fall 2018 | <i>Weather Stations to Estimate and Validate Solar Energy Impacts to the Grid</i>
PPI Realizing the Digital Enterprise Poster Reception |

INDUSTRY EXPERIENCE

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| Microsoft Research – Research Intern
<i>Project: Automatic Induction of Interpretable Document Templates using LLMs</i> | Summer 2023 |
| Microsoft Research – Research Intern
<i>Project: : Automatic Template Discovery using Language Model embeddings</i> | Summer 2022 |
| Transorg Analytics – Data Scientist
<i>Implemented data mining and machine learning solutions for demand forecasting, and targeted marketing</i> | 2016 – 2018 |
| India Smart Grid Forum – Research Intern
<i>Assisted in research and data collection for the Machine-to-Machine Communication Roadmap (Power Sector)</i> | Summer 2015 |

TALKS & PANELS

Fall 2023	Talk: <i>Automatic Induction of Interpretable Document Templates</i> Microsoft Research
Spring 2023	Panelist: <i>How do next-generation researchers see Mode 2 science?</i> International Workshop of the Society of Design and Process Science (SDPS)
Fall 2022	Talk: <i>Automatic Template Discovery</i> Microsoft Research
Spring 2022	Invited Talk: <i>Language, Representations and Leakage</i> RAISE Lab, Syracuse University
Spring 2022	Talk: <i>Interpretable Privacy Preservation of Text Representations Using Vector Steganography</i> AAAI 2022 Doctoral Consortium CERIAS Security Symposium 2022

TEACHING

Fall 2023, Spring 2023, Fall 2022, Spring 2022	Guest Instructor - Natural Language Technologies (CNIT 519) Course Instructor: Dr. Julia Taylor Rayz Lectures covering Transformer based language modeling, contextual word representations and word-sense relations
Spring 2023	Guest Instructor - Research Methodology and Design (CNIT 322) Course Instructor: Dr. Tatiana Renae Ringenberg Lectures covering research methods in Natural Language Processing

MENTORSHIP

2023	Krishnakanth Alagiri (Graduate). Topic: Instruction tuning LLMs to decipher grooming strategies in online chats.
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REVIEWING

The 11th International Conference on Learning Representations (ICLR)	2023
The 61st Annual Meeting of the Association for Computational Linguistics (ACL)	2023
Spring Undergraduate Research Conference, Purdue University	2022
International Conference on Cyberworlds (CW)	2021

SERVICE

Officer (Research and Engagement): Purdue CIT Graduate Student Association	2023-24
Program Committee Member: European Interdisciplinary Cybersecurity Conference (EICC)	2023
Student Organizer: Conference of the North American Fuzzy Information Processing Society (NAFIPS)	2021
Graduate Student Advisor: Purdue CIT Student Council	2019-20
Head, Public Relations: IEEE Delhi Technological University Student Branch (IEEE-DTU)	2015-16
Secretary: Women in Engineering, Delhi Technological University Student Branch (WIE-DTU)	2015-16

PROFESSIONAL AFFILIATIONS

- Association of Computational Linguistics (ACL)
- Center for Education and Research in Information Assurance and Security (CERIAS)
- Institute of Electrical and Electronic Engineers (IEEE)
- North American Fuzzy Information Processing Society (NAFIPS)
- Association for the Advancement of Artificial Intelligence (AAAI)
- Association for Computing Machinery (ACM)

TECHNICAL SKILLS

Programming: Python, SQL (Postgres), R, L^AT_EX, Git

Libraries: pandas, NumPy, Matplotlib, pytorch, beautifulsoup4, tensorflow, gensim

Visualization: Tableau, Prezi, Photoshop, Procreate

Statistics: Statistics Probability Theory, GLMs, LMEMs, Bayesian Models

Natural Languages: English, Hindi

REFERENCES

*Available upon request