

Heather Broome

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heatherbroome.com

Education

University of Illinois at Urbana-Champaign

PhD in Computer Science, Advised by Dr. H Chad Lane

Champaign, IL

Aug. 2024 – May 2029

University of Southern Mississippi

B.S. in Computer Science, Summa Cum Laude, Honors College

Hattiesburg, MS

Aug. 2020 – May 2024

Research Experience

INVITE Institute, University of Illinois at Urbana-Champaign

Champaign, IL

Graduate Researcher (Aug. 2024 – Present)

Advisor: Dr. H Chad Lane

- Leading the development of an AI teaching assistant that integrates retrieval-augmented generation, tool-calling, and SQL agents to analyze classroom data and student progress.

National Center for Supercomputing Applications

Champaign, IL

Graduate Mentor, REU FoDOMMaT (May 2025 – Aug. 2025)

- Mentored undergraduates on ML research projects and taught a PyTorch-focused deep learning bootcamp covering model training, evaluation, and ethics.

Graduate Researcher, CAII (Jan. 2025 – May 2025)

Advisor: Dr. Volodymyr Kindratenko

- Developed an LLM-based safety classification system to detect unsafe prompts on UIUC.chat, a tutoring platform serving UIUC students.

Undergraduate Researcher, REU FoDOMMaT (May 2023 – Aug. 2023)

Advisor: Dr. Chenhui Shao, Dr. Seid Koric

- Adapted pretrained image classification models for real-time quality prediction in ultrasonic welding.

Cyber Innovations Lab, University of Southern Mississippi

Hattiesburg, MS

Undergraduate Researcher (May 2022 – May 2024)

Advisor: Dr. Nick Rahimi

- Published two papers on ML-based cybersecurity, focusing on SMS malware classification and adversarial attack detection in darknet traffic.
- Completed undergraduate thesis developing and fine-tuning an LSTM on historical text, investigating preprocessing methods that reduced training time while maintaining output quality.

Publications

- Harrison, N., Broome, H., Shrestha, Y., Robles, A., Gautam, A., and Rahimi, N. (2024). “Adversarial Attack Optimization and Evaluation for Machine Learning-based Dark Web Traffic Analysis.” *33rd Conference on Software and Data Engineering*, 3–13. DOI: 10.1007/978-3-031-75201-8_1.
- Broome, H., Shrestha, Y., Harrison, N., and Rahimi, N. (2022). “SMS Malware Detection: A Machine Learning Approach.” *2022 International Conference on Computational Science and Computational Intelligence*, 937–942. DOI: 10.1109/CSCI58124.2022.00167.

Technical Skills

- **Programming:** Python, C++, SQL
- **ML/Data:** PyTorch, TensorFlow, scikit-learn, pandas, HuggingFace

Awards and Honors

- Fiddler Innovation Graduate Student Fellowship, 2025
- Honors College Discovery Scholar Research Grant, 2022