

Thu Bui

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[LinkedIn](#) | [Google Scholar](#) | [Personal Website](#)

Research Interests

Research focuses on human-centered AI, specifically the design and development of multimodal, Large Language Model (LLM)-driven social agents for personalized mental-health assessment, intervention, and support. These agents are designed to build rapport and provide context-aware assistance tailored to individual needs and behaviors. This work is grounded in a machine-learning background spanning Graph Neural Networks (GNNs), generative-model evaluation, and Out-of-Distribution (OOD) robustness.

Education

Purdue University

Ph.D. in Computer Science

West Lafayette, IN

Aug. 2021 – Present

Trinity College

B.S. in Computer Science and Mathematics, Magna Cum Laude with Honors

Hartford, CT

Sept. 2017 – May 2021

Research Experience

Graduate Research Assistant, Purdue University

Advisor: Professor Sooyeon Jeong

West Lafayette, IN

January 2025 – Present

- **Well-Being Assessment:** Evaluated pretrained LLMs for predicting well-being from open-ended videos, showing that LLMs outperformed regression baselines. Designing a conversational LLM-based agent to support low-burden, multimodal assessment of mental well-being through natural dialogue.
- **Voice Agent for College Students:** Building a web-based AI voice agent for students with executive-function challenges, integrating GPT-based conversation, Cognitive Behavioral Therapy lessons, a smart task planner, and Behavioral Activation reflections; pilot results show measurable gains in time management, emotional well-being, and task completion.
- **AI-Assisted Gratitude Writing:** Building and studying an HCI platform comparing AI scaffolding and co-writing for gratitude exercises, examining how AI can help users reflect more deeply, overcome writing blocks, and engage meaningfully in emotionally significant writing.

Graduate Research Assistant, Purdue University

Advisor: Professor Bruno Ribeiro

West Lafayette, IN

May 2022 – December 2024

- **Graph ML & Evaluation:** Developed a training-free propagation method for GNNs, reducing runtime by up to $6\times$ and memory usage by up to $3\times$; introduced a metric and split strategy to distinguish true generation from memorization.
- **Robustness & OOD:** Designed test-time adaptation for API-only models under color transforms, improving accuracy by up to 10% over baselines.
- **Applied ML for Manufacturing:** Designed a real-time audio model for CNC chatter detection, achieving 96% accuracy in known conditions and 94.5% accuracy in unknown conditions.

Undergraduate Research Assistant, Trinity College

Advisors: Professors Ryan Pellico, Ewa Syta, and Takunari Miyazaki

Hartford, CT

May 2019 – May 2021

- **Math Thesis:** Developed a spectral graph-based shortest-path method; proved correctness on trees and unicyclic graphs; analyzed spectral patterns and vibration modes.
- **Computer Science Capstone:** Evaluated hash functions on expander graphs; outperformed non-cryptographic baselines on Random-Method graphs; identified optimization opportunities.

Publications

- [1] **Thu Bui**, Minjun Choi, Shifa Somji, Hillary Merzdorf, Nan Kong, Louis Tay, Sooyeon Jeong. *Beyond Surveys: Predicting Student Well-being from Open-ended Video Responses using LLMs*, International Conference on Multimodal Interaction (ICMI), Long Paper, to appear.
- [2] **Thu Bui**. *Designing Multimodal Conversational AI for Longitudinal Well-Being Monitoring*, International Conference on Multimodal Interaction (ICMI), Doctoral Consortium, to appear.
- [3] **Thu Bui**, Carola-Bibiane Schönlieb, Bruno Ribeiro, Beatrice Bevilacqua, Moshe Eliasof. *On the Effectiveness of Random Weights in Graph Neural Networks*, European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD), Research Track, to appear.
- [4] **Thu Bui**, Anugunj Naman, Carola-Bibiane Schönlieb, Bruno Ribeiro, Beatrice Bevilacqua, Moshe Eliasof. *Random Propagations in GNNs*. UniReps Workshop, NeurIPS 2024 (Extended Abstract).
- [5] Mai Elkady, **Thu Bui**, Bruno Ribeiro, David I. Inouye. *Vertical Validation: Evaluating Implicit Generative Models for Graphs on Thin Support Regions*. Uncertainty in Artificial Intelligence (UAI), Proc. PMLR 244, 2024.
- [6] Eunseob Kim, **Thu Bui**, Junyi Yuan, S. Chandra Mouli, Bruno Ribeiro, Raymond A. Yeh, Michael P. Fassnacht, Martin B. G. Jun. *Online Real-Time Machining Chatter Sound Detection Using Convolutional Neural Network by Adopting Expert Knowledge*. Manufacturing Letters, Vol. 41, pp. 1386–1397, Oct. 2024.

Honors and Awards

- Fall 2024 WISP Travel Grant in Computer Science, Graduate Women in Science Program, \$1,000.
- Marjorie V. Butcher Actuarial Studies and Applied Mathematics Prize, Department of Mathematics, Trinity College, 2021.
- The Phi Gamma Delta Prizes in Mathematics, Department of Mathematics, Trinity College, 2019, 2020.

Teaching Experience

Graduate Teaching Assistant, Purdue University West Lafayette, IN
Courses include CS 180, CS 182, and CS 475 Human-Computer Interaction *Aug. 2021 – Present*

- Held weekly office hours, instructed lab sessions, and graded assignments/exams.
- Supported students in introductory programming, theoretical foundations, and HCI concepts through hands-on instruction and problem-solving guidance.

Industry Experience

Data Analysis Intern, Shinhan Bank Ho Chi Minh City, Vietnam
Retail Products Analysis *May 2018 – Aug. 2018*

- Conducted monthly market surveys and competitive analyses to identify trends, improve profitability, reduce costs, and grow market share.

Professional Service

Reviewer: ACM THRI Journal; NeurIPS 2026; ICLR 2025, 2026; UniReps Workshop 2024.

Invited Speaker: Purdue University’s SMART Films Consortium 2023; Mathematical Association of America Northeastern Section Fall 2019 Conference.

Technical Skills

Programming Languages

Python, Java, C

Deep Learning Frameworks & Libraries

PyTorch, TensorFlow, scikit-learn, OpenCV, pandas,
NumPy, Matplotlib

HCI / Multimodal / Agents

OpenSMILE, librosa, OpenFace, LIWC

Tools

Git, Docker, Azure