

Luke M. Guerdan CV

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Education

Ph.D in Human-Computer Interaction | Carnegie Mellon University | August 2021–

Advisors: Dr. Steven Wu, Dr. Ken Holstein

Courses: Introduction to Machine Learning (Ph.D), Deep Reinforcement Learning and Control

MPhil in Advanced Computer Science | University of Cambridge | October 2020–June 2021

Honors with Distinction (87%)

Advisor: Dr. Hatice Gunes

Thesis: Federated Continual Learning for Human-Robot Interaction

B.S. in Computer Science, Psychology | University of Missouri - Columbia | Aug 2015–Dec 2019

Advisors: Dr. Yi Shang, Dr. Tim Trull, Dr. Steven Hackley

GPA: 4.0/4.0

Research & Professional Experience

Research Assistant | Carnegie Mellon University | August 2021– | Pittsburgh, Pennsylvania

Conduct research at the intersection of responsible AI and human-computer interaction. Ongoing primary project involves characterizing misalignment between goals of human decision makers and machine learning optimization targets in high stakes decision scenarios.

Co-founder | TigerAware, LLC | Dec 2018–Sept 2021 | Columbia, Missouri | TigerAware.com

Developed and commercialized mobile data collection platform used by 5,000+ research participants in 20+ federally funded studies at universities and medical centers across the US. Led seven person technical team designing cross-platform systems for use in high-regulatory medical and behavioral health settings. Negotiated multi-year service contracts with IT and legal staff from universities and hospitals, including data sharing agreements, incident response plans, and compliance with applicable regulatory frameworks.

Research Assistant | University of Missouri - Columbia | Aug 2015–Dec 2019 | Columbia, Missouri

Conducted research in machine learning for behavior analysis under Drs. Yi Shang and Tim Trull. Led a team of five undergraduate and graduate students developing a method for predicting fluid intelligence from brain scans and worked with other teams to develop alcohol use and sales call success prediction pipelines. Research work featured in five MU Engineering News releases.

Research Assistant | NSF REU in Big Data Analytics | May–Aug 2019 | St. Louis, MO | [Slides](#), [Poster](#)

Developed dynamic matching algorithms for homelessness reduction under Dr. Chien-Ju Ho at Washington University in St. Louis. Used linear programming techniques to develop an online matching algorithm that pairs dynamically arriving agents with housing interventions.

Honors Psychology Capstone Program | Aug 2018–May 2019 | PI: Dr. Steven Hackley | [Thesis](#)

Designed and conducted a study examining storage of unconsciously perceived information in working memory. Used continuous flash suppression paradigm to suppress items from awareness and tested whether suppressed items occupy visual working memory capacity.

Research Assistant | Berlin Institute of Technology | May–Aug 2018 | Berlin, Germany

Developed supervised machine learning techniques for predicting body kinematics from electroencephalogram (EEG) recordings. Presented work at German news networks, the DAAD RISE Intern Summit, and IEEE Conference on Neural Engineering (NER).

Software Engineering Intern | Environmental Systems Research Institute | May–Aug 2017 | Redlands, California

Performed C++ software development and optimized geospatial database queries to reduce performance bottlenecks. Developed virtual reality-based climate change visualization tool, which received 2nd place among fifteen teams in an internship hackathon.

Research Assistant | NSF REU in Networking Technologies | May–Aug 2016 | Columbia, Missouri

Developed an offline disaster management framework for improving emergency responses under Dr. Prasad Calyam. Field tests with the leading Missouri disaster response team indicated platform cuts emergency response time in half. Presented results to state legislators and funding donors.

Publications

(* equal contribution; [see Google Scholar](#) for paper links)

Conference & Journal:

- K. Park, K. Meiss, **L. Guerdan**, E. Cheng, J. Burchard, J. Gillis, D. Weber, P. Calyam, and S. Ahmad, "Real-time geotracking and cataloging of mass casualty incident markers in a search and rescue training simulation: Pilot study," *American Journal of Disaster Medicine*, vol. 14, no. 2, pp. 89-95, 2019.
- L. Gehrke*, **L. Guerdan***, and K. Gramman, "Extracting Motion-Related Subspaces from EEG in Mobile Brain/Body Imaging Studies," in *2019 9th International IEEE/EMBS Conference on Neural Engineering (NER)*, 2019: IEEE, pp. 344-347.
- W. Morrison, **L. Guerdan**, J. Kanugo, T. Trull, and Y. Shang, "Tigeraware: An innovative mobile survey and sensor data collection and analytics system," in *2018 IEEE Third International Conference on Data Science in Cyberspace (DSC)*, 2018: IEEE, pp. 115-122.
- **L. Guerdan**, O. Apperson, and P. Calyam, "Augmented resource allocation framework for disaster response coordination in mobile cloud environments," in *2017 5th IEEE International Conference on Mobile Cloud Computing, Services, and Engineering (MobileCloud)*, 2017: IEEE, pp. 45-52.
- P. Sun, N. Wergeles, C. Zhang, **L. Guerdan**, T. Trull, and Y. Shang, "ADA-automatic detection of alcohol usage for mobile ambulatory assessment," in *2016 IEEE International Conference on Smart Computing (SMARTCOMP)*, 2016: IEEE, pp. 1-5.

Workshops and Preprints:

- **L. Guerdan**, H. Gunes, “Decentralized Robot Learning for Personalization and Privacy”, *under review*, 2022.
- **L. Guerdan**, K. Holstein, S. Wu, “Under-reliance or misalignment? How proxy outcomes limit measurement of appropriate reliance in AI-assisted decision-making”, in *CHI Workshop on Trust and Reliance in AI-Human Teams (TRAIT)*, 2022.
- A. Kawakami, **L. Guerdan**, Y. Cheng, A. Sun, A. Hu, K. Glazko, N. Arechiga, M. Lee, S. Carter, H. Zhu, K. Holstein, “Towards a Learner-Centered Explainable AI,” in *CHI Workshop on Human-Centered Explainable AI (HCXAI)*, 2022.
- **L. Guerdan**, A. Raymond, H. Gunes, “Toward Affective XAI: Facial Affect Analysis for Understanding Explainable Human-AI Interactions,” in *ICCV Workshop in Responsible Pattern Recognition & Machine Intelligence*, 2021.
- **L. Guerdan***, P. Sun*, C. Rowland, L. Harrison, Z. Tang, N. Wergeles, and Y. Shang, “Deep Learning vs. Classical Machine Learning: A Comparison of Methods for Fluid Intelligence Prediction,” in *Challenge in Adolescent Brain Cognitive Development Neurocognitive Prediction*, 2019: Springer, pp. 17-25.

Posters & Presentations

- **L. Guerdan**, C. Ho, and S. Das, “Dynamic Matching Algorithms for Homelessness Reduction,” *CSE REU Final Presentation*, 2019. [[slides](#), [poster](#)]
- **L. Guerdan**, A. Underwood, and S. Hackley, “Unconscious Information Processing in Working Memory,” *Poster presented at the Midwestern Psychological Association Conference*, April 2019, Chicago, Illinois.
- **L. Guerdan**, L. Gehrke, and K. Gramman, “Extracting Motion-Related Subspaces from EEG in MOBI Studies,” *Talk given at RISE Intern Summit*, July 2018, Heidelberg, Germany. [[slides](#)]
- **L. Guerdan** and P. Calyam, “Augmented Resource Allocation in Disaster Scenarios,” *Poster presented at the Annual Undergraduate Research and Creative Achievements Forum*, August 2016, Columbia, MO.
Also presented at Undergraduate Research Day at the Capitol, April 2019, Jefferson City, MO.

Research Funding

- Robert Wood Johnson Foundation Mood Challenge Semi-Finalist (\$20,000) Spring 2016
National competition calling for proposals for ResearchKit studies that will further our understanding of mood and how it relates to our daily lives, health, and well-being.
- University of Missouri Interdisciplinary Innovations Fund Award (\$25,000) Spring 2017
The Interdisciplinary Innovations Fund provides seed money for student-centered, interdisciplinary projects that demonstrate leadership in using information technology.

Awards, Scholarships, & Fellowships

- **NSF Graduate Research Fellowship** Spring 2020
- University of Missouri Award for Academic Distinction Spring 2019
Awarded to top 15 of ~22,000 undergraduates for intellectual achievements.
- DAAD RISE Fellowship Summer 2018

- **Barry M. Goldwater Scholarship** in Science and Engineering Spring 2018
- Outstanding Junior in Computer Science Spring 2018
 Awarded to top computer science junior as selected by department faculty.
- Garmin ECE Scholarship Spring 2017

Extracurricular & Volunteer Activities

Mizzou Computing Association | President Dec 2016–Dec 2017 | Vice President Dec 2015–Dec 2016 | Machine Learning SIG Leader Aug 2018 - May 2019 | Intro to Computer Science SIG Leader Fall 2019

Revitalized student computing society, increasing membership from four to ninety-five students through weekly workshops, faculty panels, and guest lectures in computing topics.

Major League Hacking | TigerHacks Assistant Director–Fall 2017 | Participant Aug 2015–March 2018

Organized hackathon drawing 300 attendees from around the Midwest.

Show Me Dharma | Board Member Jan 2019–Summer 2020 | Member Fall 2015–Summer 2020

Supported website, social media, and other digital initiatives in local Buddhist meditation society..

Technical Skills

Languages: Python (NumPy, Pandas, scikit-learn, TensorFlow, PyTorch; Flask); MATLAB; C/C++ ; JavaScript (Angular, TypeScript); HTML5/CSS; MySQL

Methodologies and Tools: Git; UNIX; AWS; Visual Studio; RESTful APIs