

Madeleine Grunde-McLaughlin

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EDUCATION

- 2021-present | **Ph.D. Student at University of Washington, Seattle, WA.**
Paul G. Allen School of Computer Science & Engineering
Co-advised by Jeffrey Heer and Daniel Weld
- 2016-2021 | **B.A. at University of Pennsylvania, Philadelphia, PA.**
Bachelor of Arts in Cognitive Science with Summa Cum Laude
Minors in Computer Science, French
- 2019 | **Community Auditing Program at Princeton University, Princeton, NJ.**
Audited Computer Vision, NLP, Advanced Graph Theory (not for credit)
- 2019 | **Study Abroad at Lyon Lumière II, Lyon, France.**
Courses in French including Neuroscience, Human Computer Interaction, and Memory

PUBLICATIONS

- CSCW 2023 | **Explanations can Reduce Overreliance on AI Systems during Decision-Making**
Helena Vasconcelos, Matthew Jörke, Madeleine Grunde-McLaughlin, Ranjay Krishna, Tobias Gerstenberg, and Michael Bernstein
ACM Conference on Computer-Supported Cooperative Work and Social Computing, 2023
- CHI 2022 | **When Do XAI Methods Work? A Cost-Benefit Approach to Human-AI Collaboration**
Helena Vasconcelos, Matthew Jörke, Madeleine Grunde-McLaughlin, Ranjay Krishna, Tobias Gerstenberg, and Michael Bernstein
ACM Conference on Human Computer Interaction, TRAIT workshop, 2022
- CVPR 2022 | **AGQA-Decomp: Measuring Compositional Consistency for Video Question Answering**
Mona Gandhi, Mustafa Öümer Gul, Eva Prakash, Madeleine Grunde-McLaughlin, Ranjay Krishna, Maneesh Agrawala
IEEE conference on Computer Vision and Pattern Recognition, 2022
- CVPR 2021 | **AGQA: A Benchmark for Compositional Spatio-Temporal Reasoning**
Madeleine Grunde-McLaughlin, Ranjay Krishna, Maneesh Agrawala
IEEE conference on Computer Vision and Pattern Recognition, 2021
- InfoVis 2020 | **Bayesian-Assisted Inference from Visualized Data**
Yea-Seul Kim, Paula Kayongo, Madeleine Grunde-McLaughlin, Jessica Hullman
IEEE Transactions of Visualization & Computer Graphics (Proceedings of InfoVis), 2020

SELECTED AWARDS AND HONORS

- 2021 | **Allen School Computer Science & Engineering Research Fellowship**
1-year fellowship from the University of Washington Allen School
- 2021 | **College Alumni Society Prize in Cognitive Science**
Awarded to the best Cognitive Science thesis at the University of Pennsylvania
- 2021 | **Phi Beta Kappa Honor Society**

RESEARCH EXPERIENCE

- 2022-present | **Dataset pruning for data analysis and generalization**, *University of Washington*
Domain: Human-AI Interaction
Mentors: Professor Jeffrey Heer, Professor Daniel Weld
- Exploring the effects of the training dataset distribution on out of distribution generalization
 - Implementing various data pruning methods to adapt the training dataset distribution
 - Adjusted influence function methods for dataset analysis and interpretability
 - Independently developing the project direction through literature reviews and iterative brainstorming
- 2021-2022 | **Question decomposition**, *Stanford University*
Domain: Vision and Language Learning
Mentors: Professor Maneesh Agrawala, Professor Ranjay Krishna
Publication: IEEE CVPR 2022
- Created a benchmark to measure a model's compositional reasoning and logical consistency
 - Designed a method to represent questions as a DAG of sub-questions related through compositional reasoning
 - Conducted a user study on Amazon Mechanical Turk to evaluate the validity of our generated questions
 - Mentored 3 undergraduate and masters students through the research process
- 2021-2022 | **Cost-benefit approach to explainable artificial intelligence**, *Stanford University*
Domain: Human-Computer Interaction
Mentors: Professor Michael Bernstein, Professor Tobias Gerstenberg, Professor Ranjay Krishna
Publications: CHI TRAIT Workshop 2022, CSCW 2023
- Formulated hypotheses peoples' overreliance on Explainable AI using a cost-benefit framework
 - Calculated power analyses and other statistical tests about the experiment results
 - Helped design, pilot, and analyze results from user studies on the Prolific platform
- 2020-2021 | **Action Genome Question Answering**, *Stanford University*
Domain: Computer Vision
Mentors: Professor Maneesh Agrawala, Professor Ranjay Krishna
Publication: IEEE CVPR 2021
- Created a benchmark to measure visual compositional reasoning with the Visual Question Answering task
 - Built a pipeline to generate over 192 million complex question answer pairs about videos
 - Developed an algorithm to balance answer distributions into a final dataset of 3.9 million question-answer pairs
 - Established a suite of metrics to measure different compositional reasoning skills
 - Applied successfully for \$10,989 AWS credits from the Stanford Institute for Human-Centered AI
- 2020-2021 | **Hierarchical reasoning in visual working memory**, *University of Pennsylvania*
Domain: Cognitive Science
Mentors: Professor Alan Stocker, Dr. Cheng Qiu
- Created an interactive task to measure attraction and repulsion biases in spatial working memory
 - Collected psychophysical data from user studies on Amazon Mechanical Turk
 - Analyzed the results of the task to infer the most likely model of the structure of visual working memory
 - Discovered a novel limitation that all previous memory models do not account for global priors across trials
- 2019 | **Bayesian interventions in visualizations**, *Northwestern University*
Domains: Human Computer Interaction, Data Visualization
Mentors: Professor Jessica Hullman, Professor Yea-Seul Kim
Publication: IEEE InfoVis 2020
- Formulated a design space for visualizations that use belief elicitation and Bayesian modeling
 - Constructed Bayesian statistical models of the cognitive effects of source trust
 - Designed and implemented interactive Bayesian visualizations through D3 and Idyll
 - Analyzed literature on source trust elicitation and risk analogies to inform project design decisions

NON-RESEARCH WORK EXPERIENCE

- 2018 | **Aravind Eye Care Systems Project Student, Madurai, India**
- Implemented a Moodle Learning Management System to track training completion for doctors and nurses
 - Led a focus group with 8 doctors to test the Learning Management System interface
 - Liaised between 5 departments to design the goals and implementation of this project
- 2017 | **Dynamix Gymnastics Assistant Camp Director, Langhorne, Pennsylvania**
- Managed a team of 11 coaches of various experience levels
 - Communicated goals and mediated interpersonal conflicts among coaches, parents, and children

SERVICE

- 2022-present | **Doctoral Colloquium Coordinator for DUB (Design Use Build), University of Washington**
- Organizing a workshop for Ph.D. students to prepare for their dissertation
 - Recruiting a co-coordinator to support preparing for the workshop
- 2022-present | **New Grad Mentor, University of Washington**
- Organizing events for new students to build community
 - Supporting first year students as they adapt to the PhD program
- 2017-2021 | **Penn for Refugee Empowerment, University of Pennsylvania**
- Served as Vice President and Director of Tutoring
 - Co-founded tutoring program that now connects 50+ volunteers to tutor refugees in Philadelphia and abroad
 - Re-structured the organization's focus to increase tutoring numbers by over 300% in one semester
 - Participated in the UN TOGETHER Campaign to promote university student led refugee aid organizations
 - Tutored high school students at the African Family and Health Organization (AFAHO) in West Philadelphia
- 2018-2021 | **Alpha Phi Omega Service Fraternity, University of Pennsylvania**
- Served as Pledge Service Chair and on the Leadership Committee
 - Volunteered at various service events in Philadelphia such as UCHC soup kitchens and Books Through Bars
 - Led a service committee that collaborated with an event cleaning streets in North Philadelphia

TECHNICAL SKILLS

Advanced - Python; Proficient - Pytorch, Tensorflow, HTML/CSS, R, Java; Basic - React, D3, Idyll