Madeleine Grunde-McLaughlin

https://madeleinegrunde.github.io/
mgrunde@cs.washington.edu

Education

2021-present | **Ph.D. Student at the 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 the 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

Applying social computing workflows for text-editing with LLMs *University of Washington*
Domain: Human-AI Interaction
Mentors: Professor Jeffrey Heer, Professor Daniel Weld, Professor Ranjay Krishna
- Implemented crowdsourcing workflows using LLMs instead of crowdworkers
- Developing a plugin on Google Docs for users to complete editing tasks
- Finding and designing metrics to measure the quality and controllability of workflow outputs
- Designing a novel workflow with respect to the strengths and weaknesses of LLMs

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

Presentations

2023 **Applying social computing workflows for text-editing with LLMs**
***Madeleine Grunde-McLaughlin**, Michelle Lam, Ranjay Krishna, Jeffrey Heer, Daniel Weld*
Poster, CRA-WP Grad Cohort for Women Conference

2021 **AGQA: A Benchmark for Compositional Spatio-Temporal Reasoning**
***Madeleine Grunde-McLaughlin**, Ranjay Krishna, Maneesh Agrawala*
Poster, Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2021

2020 **Measuring Spatio-Temporal Reasoning Through VideoQA**
***Madeleine Grunde-McLaughlin**, Ranjay Krishna, Maneesh Agrawala*
Poster, Grace Hopper Celebration of Women in Computing

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*
- Organized a workshop for Ph.D. students to get feedback on their dissertation plan
- Recruited 6 panelists across industry and academica
- Coordinated and ran a full-day event in which students present their research and faculty give feedback

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, Flask, R, Java; Basic - React, D3, Idyll