Madeleine Grunde-McLaughlin

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https://madeleinegrunde.github.io/

EDUCATION

UNIVERSITY OF WASHINGTON — ***Seattle, WA***
PhD Student in Paul G. Allen School of Computer Science and Engineering — *September 2021 - Anticipated May 2027*
Advisors: Jeffrey Heer and Daniel Weld

UNIVERSITY OF PENNSYLVANIA — ***Philadelphia, PA***
Bachelor of Arts in Cognitive Science — *August 2016 - May 2021*
Minors: Computer Science, French

PRINCETON UNIVERSITY — ***Princeton, NJ***
Audited Computer Vision, NLP, Advanced Graph Theory (not for credit) — *September - December 2019*

LYON LUMIÈRE II — ***Lyon, France***
French courses including Neuroscience, Human Computer Interaction, and Memory — *January - May 2019*

PUBLICATIONS

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

Bayesian-Assisted Inference from Visualized Data — *2020*
Yea-Seul Kim, Paula Kayongo, **Madeleine Grunde-McLaughlin**, Jessica Hullman
IEEE Transactions on Visualization and Computer Graphics 2020

PRESENTATIONS

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

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

SELECTED AWARDS

Allen School Computer Science & Engineering Research Fellowship — *2021*
1-year fellowship from the University of Washington Allen School

College Alumni Society Prize in Cognitive Science — *2021*
Awarded to the best Cognitive Science thesis each year

RESEARCH EXPERIENCE

QUESTION DECOMPOSITION — ***Stanford University***
Domain: Vision and Language Learning — *June 2021 – Present*
Mentors: Professor Maneesh Agrawala, Dr. Ranjay Krishna

- Designed a method to represent questions as a DAG of sub-questions related through compositional reasoning
- Developed metrics measuring a model's logical consistency among related questions
- Mentored 3 undergraduate and masters students through the research process
- Evaluated the validity of generated questions through an human study on Amazon Mechanical Turk

COST-BENEFIT APPROACH TO HUMAN-AI INTERACTION — ***Stanford University***
Domain: Human-Computer Interaction — *April 2021 – Present*
Mentors: Professor Michael Bernstein, Professor Tobias Gerstenberg, Dr. Ranjay Krishna

- Formulated hypotheses about the implications of the cost-benefit framework on AI overreliance
- Calculated the power analyses and other statistical tests about the experiment results
- Synthesized a literature review in the subjects of Explainable AI, Cognitive Science, and Behavioral Economics

ACTION GENOME QUESTION ANSWERING ***Stanford University***
Domain: Computer Vision *May 2020 – May 20201*
Mentors: Professor Maneesh Agrawala, Dr. Ranjay Krishna
Publication: IEEE CVPR 2021

- Built a pipeline to generate over 192 million complex question answer pairs about videos
- Developed an algorithm to balance answer distributions, leaving a final dataset of 3.9 million question-answer pairs
- Established a suite of metrics to measure different compositional reasoning skills
- Applied successfully for AWS credits through the Stanford Institute for Human-Centered Artificial Intelligence

HIERARCHICAL REASONING IN WORKING MEMORY ***University of Pennsylvania***
Domain: Cognitive Science *January 2020 - May 2021*
Mentors: Professor Alan Stocker, Dr. Cheng Qiu

- Created an interactive task to measure attraction and repulsion biases in spatial working memory
- Analyzed the results of the task to infer the most likely model of the structure of visual working memory
- Wrote a literature review about previous tactics used to predict the structure of working memory

BAYESIAN INTERVENTIONS ***Northwestern University***
Domain: Human Computer Interaction *June - December 2019*
Mentors: Professor Jessica Hullman, Professor Yea-Seul Kim
Publication: IEEE InfoVis 2020

- Formulated a design space for visualizations using 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

THEY DRAW IT! ***Northwestern University***
Domain: Human Computer Interaction *June - August 2019*
Mentors: Professor Jessica Hullman, Francis Nguyen

- Implemented multiple style functionalities for tool helping journalists create interactive visuals
- Contributed to design decisions about improving interface useability
- Brainstormed questions to ask journalists about interactive visualizations and analyzed responses

WORK EXPERIENCE

ARAVIND EYE CARE SYSTEMS ***Madurai, India***
Project Student *May - August 2018*

- Implemented a Moodle Learning Management System to track training completion for doctors and nurses
- Lead a focus group with 8 doctors to test the Learning Management System interface
- Liaised between 5 departments on designing the goals and implementation of this project

DYNAMIX GYMNASTICS ***Levittown, Pennsylvania***
Assistant Camp Director *June - August 2017*

- Managed a team of 11 coaches of various experience levels
- Communicated goals to and mediated interpersonal conflicts among coaches, parents, and children

SERVICE AND LEADERSHIP

PENN FOR REFUGEE EMPOWERMENT ***University of Pennsylvania***
Leadership Positions: Vice President, Director of Tutoring *February 2017 - May 2021*

- 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

ALPHA PHI OMEGA SERVICE FRATERNITY ***University of Pennsylvania***
Leadership Positions: Pledge Service Chair, Leadership Committee *January 2018 - May 2021*

- Volunteer at various service events in Philadelphia, especially UCHC soup kitchens and Books Through Bars
- Lead a service committee that collaborated with an event cleaning streets in North Philadelphia

LANGUAGES

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