Xiaoying Pu

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Research Interests

Information visualization, human-computer interaction

Education

2022 Ph.D. in Computer Science and Engineering
Thesis: *Integrating Visualization Grammars with the Task Language of Data Analysts*
University of Michigan — *Ann Arbor, MI*

2020 M.S. in Computer Science and Engineering
University of Michigan — *Ann Arbor, MI*

2017 B.S. in Computer Science and Engineering
Bucknell University — *Lewisburg, PA*
Summa cum laude. Minor: Mathematics

Experiences

2022- Sierra Nevada Research Institute at the University of California, Merced — *Merced, CA*
Postdoctoral Scholar. Advisor: Lace Padilla, Ph.D.
Facilitating Restoration of Natural Infrastructure Using Uncertainty Communication

2017-22 University of Michigan — *Ann Arbor, MI*
Graduate Student Research Assistant. Advisor: Matthew Kay, Ph.D.

2020 Microsoft Research — *New York City, NY*
Research Intern. Mentors: Jake Hofman, Ph.D. and Dan Goldstein, Ph.D.

2019 National Renewable Energy Lab — *Golden, CO*
Visualization Intern. Mentor: Kristi Potter, Ph.D.

2016 National Center for Atmospheric Research — *Boulder, CO*
Summer Intern in Parallel Computational Science. Mentor: Rick Brownrigg, Ph.D.

2014-15 Bucknell University — *Lewisburg, PA*
Undergraduate Researcher in Computer Science. Advisor: Evan Peck, Ph.D.
Undergraduate Researcher in Geology. Advisor: Carl Kirby, Ph.D.

Grants, Honors & Awards

2020 Best Paper Honorable Mention (top 5%) for "A Probabilistic Grammar of Graphics", ACM CHI Conference on Human Factors in Computing Systems

2014-17 President's Award for Distinguished Academic Achievement, Bucknell University

2016 GHC Scholar, Anita Borg Institute, $900

2015 Travel Award, Explore Graduate Studies in CSE at University of Michigan, $350

Presentation Award (top 4%), Susquehanna Valley Undergraduate Research Symposium, $100

Honorable Mention, Mathematical Contest in Modeling — COMAP

Bucknell Program for Undergraduate Research, "Improving Computer-Mediated Decision-Making via Physiological Signals from Wearable Sensors", $3000.

2014 Katherine Mabis McKenna Environmental Internship Program, "Feasibility of using freshwater mussels to monitor Ba and Sr contamination due to shale gas flowback water in Pennsylvania streams", $3500 stipend + $600 material.

Publications & Presentations

In preparation

2022 **Pu, Xiaoying**, and Matthew Kay. "Evaluating Visualization Grammar in Data Analysis." Preparing for submission to CHI 2023.

2022 **Pu, Xiaoying**[*1], Abhraneel Sarma[*], Michael Correll, Eli T. Brown, and Matthew Kay. "Odds and Insights: Improving Evaluation of Decision-making Quality in Visual Analytics."

Under Review

2022 Davis, Russell, **Xiaoying Pu**, Yiren Ding, Brian Hall, Karen Bonilla, Mi Feng, Lane Harrison, and Matthew Kay. "The Risks of Ranking: Revisiting Graphical Perception to Model Individual Differences in Visualization Performance."

[1] *: Equal contribution.

Conference Proceedings, fully-reviewed and archival

Conferences are the main publication venues for computer science research.

2021 **Pu, Xiaoying**, Sean Kross, Jake M. Hofman, Daniel G. Goldstein. "Datamations: Animated Explanations of Data Analysis Pipelines." In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, pp. 1-14. 2021.

2020 **Pu, Xiaoying**, Matthew Kay. "A Probabilistic Grammar of Graphics". In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, pp. 1-13. 2020.

Pesé, Mert D., **Xiaoying Pu**, and Kang G. Shin. "SPy: Car Steering Reveals Your Trip Route!" In *Proceedings on Privacy Enhancing Technologies*. 2020, No. 2: 155-174.

2018 **Pu, Xiaoying**, and Matthew Kay. "The Garden of Forking Paths in Visualization: A Design Space for Reliable Exploratory Visual Analytics: Position Paper." In *2018 IEEE Evaluation and Beyond—Methodological Approaches for Visualization (BELIV)*, pp. 37-45. IEEE, 2018.

Workshop Papers and Posters, lightly-reviewed and non-archival

2022 Wacharamanotham, Chat, Fumeng Yang, **Xiaoying Pu**, Abhraneel Sarma, and Lace Padilla. 2022. "Transparent Practices for Quantitative Empirical Research." In *CHI Conference on Human Factors in Computing Systems Extended Abstracts*, pp. 1-5. 2022.

2021 **Pu, Xiaoying**, Matthew Kay, Steven M. Drucker, Jeffrey Heer, Dominik Moritz, and Arvind Satyanarayan. "Special Interest Group on Visualization Grammars." In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems*, pp. 1-3. 2021.

2019 **Pu, Xiaoying**. "Visual analytics techniques for uncertainty in power systems simulation ensembles." Presentation at *VIS 2019 Application Spotlight — Visualization Paradigms in the Renewable Energy Space*. 2019.

Pu, Xiaoying, Matthew Kay, Michael Correll, and Eli Brown. "Unbiasing Visual Data Exploration in the Garden of Forking Paths." In *CHI 2019 Workshop on Human-Centered Study of Data Science Work Practices*. 2019.

Pu, Xiaoying, Licheng Zhu, Matthew Kay, and Frederick Conrad. 2019. "Designing for Preregistration: a User-Centered Perspective." In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*, pp. 1-6. 2019.

2018 Kay, Matthew, **Xiaoying Pu**, and Frederick Conrad. Preregistration: Assessing Whether the Pledge Matches the Report. Presentation at *APA Annual Convention, San Francisco, CA*. 2018.

2014 **Pu, Xiaoying** and Carl S. Kirby. "Feasibility of using freshwater mussels to monitor Ba and Sr contamination due to shale gas flowback water in Pennsylvania streams." In *Geological Society of America Abstracts with Programs*, Vol. 46, No. 6, p.315. 2014.

Teaching

Instructor

2022 Transparent Practices for Quantitative Empirical Research — *CHI 2022 online course, N=22*
Designed and delivered a live-coding R tutorial for transparency-oriented visualizations.

Graduate Student Instructor

WN 2021 EECS 203 - Discrete Mathematics (online, N=900+)
Taught weekly discussion sections, designed homework, and hosted office hours as part of an instruction team.

Undergraduate Teaching Assistant

Answered student questions in lab.

SP 2016 CSCI 204L - Introduction to Computer Science II lab
CSCI 206L - Computer Organization and Programming lab
FA 2016 CSCI 208L - Programming Languages lab
FA 2014 PHYS 211L - Classical & Modern Physics lab

Teaching Training

2021 Center for Research on Learning and Teaching (CRLT) training at the University of Michigan
Two-part training that covered learning science, and inclusive & equitable teaching.

SP 2017 UNIV 239 - Working with Writers: Theory and Practice at Bucknell
Semester-long training course for working as a writing consultant.

Service

Paper Reviews

2022 VIS 2022 Papers, CHI 2022 Papers with Special Recognitions for Outstanding Reviews

2021 TVCG 2021 papers, VIS 2021 Papers, short papers, TREX workshop

2020 CHI 2020 Papers with Special Recognitions for Outstanding Reviews

2019 CHI 2019 Late Breaking Work, alt.chi, VIS 2019 InfoVis Papers

Outreach

2022 Carillon Studio Concert: Broadening the Carillon Repertoire at the "Diversity and Belonging: Unsung Keyboard Stories" conference
Performed two carillon pieces from *Music by Black Composers*.

2020 Earth Day 50 Teach-Out, University of Michigan
Performed a nature-themed carillon arrangement.

2019-20 Data Visualization Rackham Interdisciplinary Workshops, University of Michigan
Student coordinator for a university-wide visualization speaker series.

2018-19 Middle school outreach program with GirlsEncoded, University of Michigan

SP 2016 President. Bucknell ACM Women-in-Computing Chapter

2016 First Bucknell Admissions Outreach for promoting diversity

Student Mentoring

2021 Sophia Wang, undergraduate student at the University of Michigan

2020-21 Daniel Wang, undergraduate student at Northwestern University

2019-20 Qiang Cheng (Statistics), undergraduate student at the University of Michigan

2018–19 Dillon Zaugg, undergraduate Research Opportunity Program (UROP) at the University of Michigan