

CONTACT [xpu@umich.edu](mailto:xpu@umich.edu)  
 INFORMATION [xiaoyingpu.github.io](https://xiaoyingpu.github.io)

RESEARCH INTERESTS Uncertainty visualizations, visual analytics, scientific communication.

EDUCATION **University of Michigan**, Ann Arbor, MI

Ph.D. pre-candidate in Computer Science and Engineering 2017-

**Bucknell University**, Lewisburg, PA

B.S., [Computer Science and Engineering](#), 4.0/4.0. 2013 - 2017

RESEARCH EXPERIENCES **Graduate Student Research Assistant** Fall 2017 -  
 Advisor: Matthew Kay, Ph.D. (School of Information)  
 Computer Science and Engineering, University of Michigan, Ann Arbor, MI  
 Member of the [Midwest Uncertainty Collective](#).

*Research projects:*

- Using Bayesian hierarchical models to study decision-making aided by uncertainty visualizations in MTurk experiments.
- Designing and implementing a probabilistic grammar of graphics.
- Proposed a design space for reliable exploratory visual analytics.
- Conducted a qualitative interview study to understand the use of preregistration.

**Computer Science (Visualization) Intern** Summer 2019

Mentor: Kristi Potter, Ph.D.

Insight Center

National Renewable Energy Laboratory (NREL), Golden, CO

- Context: energy systems (power grid) integration research.
- Iteratively prototyped interactive visualizations with scientists.
- Designed two new visual representations for dynamical system concepts.
- Reviewed uncertainty visualization techniques applied to visual analytics.

**Summer Internship in Parallel Computational Science** Summer 2016

*Visualization, interdisciplinary collaboration*

Advisor: Rick Brownrigg, Ph.D.

Computational and Information Systems Lab (CISL)

National Center for Atmospheric Research (NCAR), Boulder, CO

- Examined and cleaned climate model outputs with NCL and GDAL.
- Visualized climate model similarity with multidimensional scaling.
- Used an MIQP optimizer to achieve a non-overlapping layout.
- Collaborated closely with NCAR climate scientists.

**Undergraduate Researcher** May 2015 - Dec 2015

*Physiological computing, human-computer interaction*

Advisor: Evan M. Peck, Ph.D.

Department of Computer Science at Bucknell University

- Extended and optimized a physiological computing framework.
- Adopted MQTT protocol for streaming data across platforms.
- Used machine learning (Weka) to classify real-time cognitive load.
- Designed protocol to quantify implicit bias in decision-making.

**Undergraduate Researcher** Summer 2014

*Environmental geochemistry*

Advisor: Carl S. Kirby, Ph.D.

Department of Geology & Environmental Geosciences at Bucknell University

- Collected and analyzed field water quality data.
- Used freshwater mussels as biomarkers for heavy metal contaminants.
- Analyzed high spatial resolution *in-situ* concentration of Barium and Strontium in thin-sections from electron probe microanalysis (EPMA).

PUBLICATION **Xiaoying Pu** and Matthew Kay. 2018. The Garden of Forking Paths in Visualization: A Design Space for Reliable Exploratory Visual Analytics. *2018 IEEE Evaluation and Beyond - Methodological Approaches for Visualization (BELIV 2018)*.

UNDER REVIEW **Xiaoying Pu**, and Matthew Kay. 2019. A Probabilistic Grammar of Graphics. *CHI 2020*.

PRESENTATIONS **Xiaoying Pu**, Licheng Zhu, Matthew Kay, and Frederick Conrad. 2019. Designing for Preregistration: a User-Centered Perspective. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI19 Extended Abstracts)*, May 4-9, 2019, Glasgow, Scotland UK. ACM, New York, NY, USA, 6 pages. <https://doi.org/10.1145/3290607.3312862>

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

**Xiaoying Pu**. 2016. Visualizing Intermodel Comparison of Climate Simulations. *SIParCS program student presentations*.

**Xiaoying Pu** and C.S. Kirby. 2014. Feasibility of using freshwater mussels to monitor Ba and Sr contamination due to shale gas flowback water in Pennsylvania streams. *Geological Society of America Abstracts with Programs, Vol. 46, No. 6, p.315*. (Poster presentation at 2014 Geological Society of America Annual Meeting in Vancouver, BC.)

IN PREPARATION

C.S. Kirby and **Xiaoying Pu**, Feasibility of using freshwater mussels to monitor Ba and Sr contamination due to shale gas flowback water in Pennsylvania streams. Environmental Science & Technology or Applied Geochemistry.

AWARDS	GHC Scholar — Anita Borg Institute	Oct. 2016
	Competitive stipend for attending the Grace Hopper Celebration, \$900	
	Oral Presentation Award (top 4%)	Aug. 2015
	Susquehanna Valley Undergraduate Research Symposium, \$100	
HONOR SOCIETIES	Honorable Mention	Feb. 2015
	Mathematical Contest in Modeling — COMAP	
	Tau Beta Pi	
	Phi Beta Kappa (7 out of 900)	
GRANTS	Bucknell Program for Undergraduate Research	Summer 2015
	“Improving Computer-Mediated Decision-Making via Physiological Signals from Wearable Sensors”, \$3000.	
	Katherine Mabis McKenna Environmental Internship Program	Summer 2014
GRADUATE COURSEWORK	<ul style="list-style-type: none"> <li>• Probability and Distribution Theory</li> <li>• Natural Language Processing</li> <li>• Machine Learning</li> <li>• Social Computing Systems</li> <li>• Principles of Real-time Computing</li> <li>• Advanced Topics in Computer Architecture</li> <li>• Carillon Performance &amp; Literature</li> </ul>	
TEACHING EXPERIENCES	<b>Undergraduate Teaching Assistant</b>	
	• CSCI 208L - Programming Languages lab	Fall 2016
	• CSCI 204L - Introduction to Computer Science II lab	Spring 2016
	• CSCI 206L - Computer Organization and Programming lab	Spring 2016
	• PHYS 211L - Classical & Modern Physics lab	Fall 2014
SERVICE	Data Visualization Rackham Interdisciplinary Workshop	Fall 2019 -
	Middle school outreach program with GirlsEncoded	Winter 2018 -
	President. Bucknell ACM Women-in-Computing Chapter	Spring 2016
	First Bucknell Admissions Outreach for promoting diversity	Jan. 2016
SKILLS	<ul style="list-style-type: none"> <li>• R, C/C++, Java, Python, Verilog, and MATLAB.</li> <li>• Statistical modeling, experimental design, applied machine learning, visualization, computer networks, and qualitative interview.</li> </ul>	