Xiaoying Pu ***Curriculum vitae***

CONTACT INFORMATION
xpu@umich.edu
xiaoyingpu.github.io

RESEARCH INTERESTS
Uncertainty visualizations, visual analytics, scientific communication.

EDUCATION

University of Michigan, Ann Arbor, MI

Ph.D. precandidate 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).*

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

Honorable Mention — Feb. 2015
Mathematical Contest in Modeling — COMAP

Honor Societies

Tau Beta Pi
Phi Beta Kappa (7 out of 900)

Grants

Bucknell Program for Undergraduate Research — 2015
"Improving Computer-Mediated Decision-Making via Physiological Signals from Wearable Sensors", $3000.

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

Graduate Coursework

- Probability and Distribution Theory
- Natural Language Processing
- Machine Learning
- Social Computing Systems
- Principles of Real-time Computing
- Advanced Topics in Computer Architecture
- Carillon Performance & Literature

Teaching Experiences

Undergraduate Teaching Assistant

- 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

- R, C/C++, Java, Python, Verilog, and MATLAB.
- Statistical modeling, experimental design, applied machine learning, visualization, computer networks, and qualitative interview.