# Caitlin Kuhlman

cakuhlman@wpi.edu
https://caitlinkuhlman.github.io


## Education

**2020** *expected*
PhD Computer Science, Worcester Polytechnic Institute
*Dissertation: Ranking for Decision Making: Fairness, Accountability, and Usability*
*Advisor: Elke Rundensteiner*

**2017**
MS Computer Science, Worcester Polytechnic Institute
*Thesis: Pivot-based Data Partitioning for Distributed k Nearest Neighbor Mining*

**2013**
Major Certificate in Computer Science, University of Massachusetts Boston

**2007**
BFA Fine Arts 3D, Massachusetts College of Art and Design

## Research Experience

**Aug 2014 - Present**
**Research Assistant** Advisor: Elke Rundensteiner
*Computer Science Department, Worcester Polytechnic Institute*

Researcher in the Data Science Research Group, focused on data mining and machine learning, human-computer interaction, and algorithmic fairness.

Lead researcher and developer on MATTERS, an online analytics dashboard for understanding the economic competitiveness of U.S. states.

Supervisor of undergraduate student teams for Major Qualifying Projects including:

- RanKit, an interactive learning-to-rank analytics tool.
- A system to automatically integrate heterogeneous online datasets.
- A suite of tools for data management currently in use by MATTERS data curation team.
- A Public-facing API providing access to a collection of over 30 datasets.

*Technologies: Python, Java, PostgreSQL, Javascript, D3*

**May - Aug 2016**
**Data Science for Social Good Fellow**
*IBM Research Yorktown Heights, NY*

One of six researchers selected to work with IBM and partner social good organizations. Project focus: quantify innovation in countries around the world using open data. Analyzed over 1400 economic, demographic, and environmental datasets. Published an Open Innovation Index based on a group-lasso regression model and heirarchical clustering of features.
*Technologies: Python, Jupyter*

**June-Aug 2014, 2015**
**Technical Intern**
*MITRE Corporation Bedford, MA*

Joined a small research team over two consecutive summers. Analyzed TB scale data for cyber-security applications and prototyped a supervised learning-based intrusion detection system.
*Technologies: Java, MapReduce, Hadoop*

**May– Aug 2013**
**Research Assistant**
*Knowledge Discovery Lab, University of Massachusetts Boston*

Developed novel methods for object detection in geospatial imagery. Implemented a web client for image analysis and released an open source tool for image pre-processing.
*Technologies: Java, Weka, Javascript*

# Caitlin Kuhlman

cakuhlman@wpi.edu
https://caitlinkuhlman.github.io


## Honors and Awards

**2018** **WIN Grant** Worcester Polytechnic Institute.
*$10,000 Women's Impact Network Grant to support the 2019 WiDS Central Mass Conference.*

**2018** **GAANN Fellowship** Worcester Polytechnic Institute.

**2014** **ORISE Fellowship** Oak Ridge Institute for Science and Education.
*Appointment to the Student Research Participation Program at the U.S. Army NSRDEC.*

## Leadership

**2018** **WiDS Ambassador**
Organized the first regional Women in Data Science Central Massachusetts Conference.

**2017** **Tutorials Chair Broadening Participation in Data Mining Workshop**
Organized two tutorial sessions at workshop co-located with the ACM SIGKDD Conference.

## Selected Publications

**Caitlin Kuhlman**, MaryAnn VanValkenburg, Elke Rundensteiner. FARE: Diagnostics for Fair Ranking using Pairwise Error Metrics. *The Web Conference (WWW) Web and Society track* 2019. [pdf]

**Caitlin Kuhlman**, Paul-Henry Schoenhagen, MaryAnn VanValkenburg, Diana Doherty, Malika Nurbekova, Goutham Deva, Zarni Phyo, Elke Rundensteiner, Lane Harrison. Evaluating Preference Collection Methods for Interactive Ranking Analytics *ACM Conference on Human Factors in Computing Systems (CHI)* 2019. [link]

Latifa F. Jackson, **Caitlin Kuhlman**, Fatimah L.C. Jackson, Keolu Fox. Including Vulnerable Populations in the Assessment of Data from Vulnerable Populations. *Frontiers in Big Data* 2019. [link]

**Caitlin Kuhlman**, MaryAnn VanValkenburg, Diana Doherty, Malika Nurbekova, Goutham Deva, Zarni Phyo, Elke Rundensteiner, Lane Harrison. Preference-driven Interactive Ranking System for Personalized Decision Support. *ACM International Conference on Information and Knowledge Management (CIKM)* 2018. [link]

**Caitlin Kuhlman**, Karthikenyan Natesan Ramamurthy, Prassana Sattigeri, Aurelie C. Lozano, Lei Cao, Chandra Reddy, Aleksandra Mojsilovic, Kush R. Varshney. How to foster innovation: a data-driven approach to measuring economic competitiveness. *IBM Journal of Research and Development* 2017.

**Caitlin Kuhlman**, Yizhou Yan, Lei Cao, Elke Rundensteiner. Pivot-based Distributed K-Nearest Neighbor Mining. *European Conference on Machine Learning, Principles and Practice of Knowledge Discovery (ECML-PKDD)* 2017. [pdf]

Yizhou Yan, Lei Cao, **Caitlin Kuhlman**, Elke Rundensteiner. Distributed Local Outlier Detection in Big Data. *SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)* 2017. [pdf]

Lei Cao, Yizhou Yan, **Caitlin Kuhlman**, Qingyang Wang, Elke Rundensteiner, Mohamed Eltabakh. Multi-tactic Distance-based Outlier Detection. *IEEE International Conference on Data Engineering (ICDE)* 2017. [pdf]

Joseph Paul Cohen, Wei Ding, **Caitlin Kuhlman**, Aijun Chen, and Liping Di. Rapid building detection using machine learning. *Applied Intelligence* 45, no. 2: 443-457 2016. [pdf]