

# Xiaomei (Naomi) Wang

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## EDUCATION

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**University at Buffalo**, Buffalo, New York

Ph.D. Industrial Engineering - Human Factors, Conferred February 2020.

- GPA 3.83/4.0
- Advisor: Ann M. Bisantz
- Dissertation topic: *Towards Better Interpretability of Machine Learning-based Decision Support Systems*

**Xi'an Jiaotong University**, Xi'an, Shaanxi, China

B.S. Industrial Design, Graduated July 2014

- Thesis topic: *Voice Cloud Open Platform 5.0 Human-machine Interface Design*

## PUBLICATION

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### Peer-reviewed Journal Paper

Wang, X., Kim, T.C., Hegde, S., Hoffman, D.J., Benda, N.C., Franklin, E.S., Lavergne, D., Perry, S.J., Fairbanks, R.J., Hettinger, A., Roth, E.M., Bisantz, A.M. (2019). Design and Evaluation of an Integrated, Patient-focused Electronic Health Record Display for Emergency Medicine. *Applied Clinical Informatics*, 10 (4), 693-706.

Wang, X., Bisantz, A. M., Bolton, M., Cavuoto, L., Chandola, V. (2020). Explaining Supervised Learning Models – A Case Study on Binary Classifiers. *Ergonomics in Design*.

Son, C., Hegde, S., Smith, A., Wang, X., Sasangohar, F. (2020) Effects of COVID-19 on College Students' Mental Health in the United States: Interview Survey Study. *J Med Internet Res*, 22(9):e21279

Wang, X., Hegde, S., Son C., Keller, B., Smith, A., Sasangohar, S. (2020) Investigating Mental Health of US College Students During the COVID-19 Pandemic: Cross-Sectional Survey Study. *J Med Internet Res*, 22(9):e22817

### Manuscripts under Submission and Preparation

Roth, E. M., Bisantz, A. M., Wang, X. Leveraging Cognitive Performance Support Objectives for More Diagnostic System Evaluation Questionnaires. *Journal of Cognitive Engineering and Decision Making*. (under submission)

Wang, X., Markert, C., Sasangohar, F. Investigating the Adoption and Usage of Mental Health Mobile Applications During the COVID-19 Pandemic. *Human Factors*. (under revision)

Wang, X., Blumenthal, H.J., Hoffman, D., Benda, N., Kim, T., Perry, S., Franklin, E.S., Roth, E., Hettinger, A.Z., Bisantz, A.M. Predicting Patient-related Workload in the Emergency Department. *International Journal of Medical Informatics*. (under preparation)

Wang, X., Bisantz, A. M., Bolton, M., Cavuoto, L., Chandola, V. Towards Better Interpretability of Machine Learning-based Decision Support Systems. (under preparation)

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## Peer-reviewed Proceeding Papers

Wang, X., Berg, R., McGeorge, N., LaVergne, D., Benda, N., & Bisantz, A. (2018). Assessing Interaction Strategies for Health IT: An Entropy Based Approach. *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care*, 7(1), 82–86.

Wang, X., Blumenthal, H.J., Hoffman, D., Benda, N., Kim, T., Perry, S., Franklin, E.S., Roth, E., Hettinger, A.Z., Bisantz, A.M. (2019). Patient-related Workload Prediction in the Emergency Department: A Big Data Approach. *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care*, 8(1), 33–36.

Wang, X., Bisantz, A. M., Bolton, M., Cavuoto, L., Chandola, V. (2020). Cognitive Work Analysis and Visualization Design for the Graduate Admission Decision Making Process. *Proceedings of the 64<sup>th</sup> Human Factors and Ergonomics Society Annual Meeting* (in press)

Wang, X., Roth, E., Kim, T., Arora, J., Franklin, E., Hettinger, A. Z., Bisantz, A. M. (2020). Preliminary Interview Study on the Opioid Prescription Decision Making Process. *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care*, 9(1), 234–237.

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## RESEARCH EXPERIENCE

### Texas A&M University, ACE Lab

February 2020 - Present

Postdoctoral Researcher

- Leading an offshore oil rig safety project, funded by the National Academies of Sciences, Engineering, and Medicine
- Leading research projects about mental health under the COVID-19
- Assisting in proposal preparation about a human-AI teaming project
- Project management and student mentoring for multiple projects
- Assisted in the course material preparation for ISEN Human Factors in Healthcare

### PhD Dissertation

March 2017 – January 2020

Topic: making machine learning based decision support interpretable for decision makers, with respect to graduate admission decision making process

- Interviewed 7 faculties from 5 different departments regarding their knowledge in graduate admission, and finished work domain analysis to understand the decision making task
- Trained 5 machine learning classification algorithms to suggest “Accept” or “Reject”
- Designed interpretations for machine learning classification algorithms and implemented a prototype of the decision support system
- Performed survey study on Amazon Mechanical Turk to test and iteratively improve the visualization design
- Conducted usability study with 12 faculties to test whether the interpretations help users to understand the algorithms, and whether the prototype system fits into the workflow

### MedStar - University at Buffalo research collaboration

May 2017 - Present

Graduate Research Assistant

(Sponsor: AHRQ)

Topic: design and evaluation of health IT systems, knowledge discovery from EHR data

- Designed interview guide for a study on opioid prescription decision making
- Led a study on knowledge discovery and statistical modeling of patient-related workload drivers from electronic health record data of an emergency department

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- Analyzed quantitative responses with R, and performed qualitative analysis on the open answer questions for the usability test of a novel patient-centered view interface
  - Conducted exploratory data analysis and simulation with Python on screen use data of a novel emergency department information system interface

**Charles River Analytics - UB research collaboration**

May 2015 - August 2015

Graduate Research Assistant

(Sponsor: U.S. Army)

Topic: evaluation of the visualization of Bayesian networks

- Assisted in designing the evaluation of the BNet.Builder™ software's representation of Bayesian probability networks
- Implemented a survey on Mechanical Turk and accomplished statistical analysis to understand how the representation affects users' judgments

**University at Buffalo**

January 2015 - May 2015

Independent Study with Dr. Changxu Wu

(Sponsor: NIH)

Topic: improving patient safety by understanding patterns of human errors

- Analyzed infusion pump entry error data and identified error patterns

Topic: enhancing driver safety through studies on warning design and drinking-driving behavior

- Deployed support vector machine algorithm to complete data analysis for an experiment that uses a seat sensor system to detect drivers' blood alcohol content
- Extracted features for the sound data of an experiment of drinking-driving behavior
- Administered a questionnaire study to measure the effectiveness of warnings in preventing driving accidents

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**TEACHING EXPERIENCE**

**Assistant lecturer**, Texas A&M University, 2020-2021

[ISEN 210]: Fundamentals of Industrial Engineering Design

**Teaching assistant**, University at Buffalo, 2015-2017

[EAS305]: Applied Probability and Statistics, 2015-2016

- Delivered a lecture on normal distribution
- Taught 12 recitation sections
- Developed homework and exam questions

[IE320]: Engineering Economy, 2016

- Graded homework and exams

[IE323]: Human Factors in System Design, 2017

- Taught 7 lab sessions

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**INTERNSHIP EXPERIENCE**

**iFlytek Co., Ltd.**

February 2014 - June 2014

UI & UX Designer

- Collected user needs through interview (13 participants) and questionnaire (103 participants)

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- Completed the design of 5.0 edition of the voice cloud open platform website (18 webpages), and the open statistics module (31 webpages).
  - Completed the usability test of the open statistics module and summarized design implications for the next edition.

**Beijing Wei Rui Da Wind Power Co.,Ltd**

July 2013 – September 2013

UI Designer

- Developed the tablet interface of grinding machine monitoring instrument CM3000
- Optimized wind field monitoring and control network, WindRDS

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**REVIEW EXPERIENCE**

Journal of Medical Internet Research, 2020

Proceeding of the Human Factors and Ergonomics Society (HFES) Annual Meeting, 2020

Student Mobile Health Design Competition of the HFES Healthcare Symposium, 2020

IEEE Transactions on Human-Machine Systems, 2018

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**INVITED TALKS**

“Towards Better Interpretability of Machine Learning – Based Decision Support Systems”,  
Texas A&M University Department of Industrial and Systems Engineering’s Seminar Series,  
College Station, TX, on April 3<sup>rd</sup>, 2020

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**PERSONAL AFFILIATION**

Member, Human Factors and Ergonomics Society, 2020-Present

Student Member, Human Factors and Ergonomics Society (HFES), 2016-2019

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**AWARDS**

Graduate Student Association Conference Funding (supported attending of 2019 Human Factors and Ergonomics in Healthcare), University at Buffalo, 2019

GSA Conference Funding, University at Buffalo (supported attending of 2017 HFES annual meeting), 2017

Scholarship for Academic Excellence, Xi’an Jiaotong University, 2011-2014

2<sup>nd</sup> Prize in the 4th Google Android App Development College Student Challenge, 2013

2<sup>nd</sup> Prize and “The Best Interface” in the “Jiaxi Cup” Software Design Competition, 2013

3<sup>rd</sup> Prize in the 2nd “Huachuang Cup” Cell Phone Application Design, 2013

3<sup>rd</sup> Prize in “Greater China SolidEdge 3D Modeling Competition”, 2011

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**PROFESSIONAL SERVICE ACTIVITIES**

Student Affairs and Awards Officer, Cognitive Engineering and Decision Making Technical Group, HFES Society, 2020-2021

HFES White Paper Committee, 2020-2021

Mentor, Academic Mentoring Group, Women in Engineering, Texas A&M University, 2020

Session Co-chair, 63<sup>rd</sup> Annual Meeting of the Human Factors and Ergonomics Society, 2019

Member, Strategic Planning Committee, ISE Department, University at Buffalo, 2018-2019

Secretary, HFES Student Chapter, University at Buffalo, 2017-2018

Volunteer, 12th Annual Human Factors Engineering Inter-University Workshop, Buffalo, NY, 11/2017

