

# ZHONGXIU “AURORA” LIU

**Data Mining, Analytics & Machine Learning:** R, SAS, Matlab, SQL, Python, Weka, SPSS | **Programming & Software Development:** Java, JavaScript, HTML, XML, CSS, C/C++, Python, Agile Development, Object Oriented Design, User-centered Design | **Research & Experimental Design:** control experiment design, user study, data collection, quantitative methods, qualitative methods, statistical analysis, academic writing, public speaking | **Domain Expertise:** E-learning, Serious (Educational) Games, Educational Psychology

## EDUCATION

**Ph.D. Computer Science, Aug 2014 – present**

**M.S. Computer Science, Dec 2016**

North Carolina State University (NCSSU), GPA 3.83/4.0, Advisor: Dr. Tiffany Barnes

**B.Sc. Computer Science, *Minor in Mathematics, Statistics*, May 2014**

Worcester Polytechnic Institute (WPI), GPA 3.8/4.0, Graduated with High Distinction

## RESEARCH EXPERIENCE

**North Carolina State University, Game2Learn Lab, Dr. Tiffany Barnes, Oct 2014 – present:**

- Mining and analyzing data of student gameplay, user-generated contents, and e-learning behaviors in large-scale educational games, intelligent tutoring system, and MOOC.
- Evaluating data-driven methods and pedagogical decisions in real classroom settings.
- Designing technology features, experiment, data-collection and research protocol.

**Worcester Polytechnic Institute, Artificial Intelligence Lab, Dr. Neil Heffernan, 2012- 2014:**

- ASSISTments is an intelligent tutor used by tens of thousands of users worldwide.
- Designed intervention messages and mechanism on detection of performance pattern.
- General programming, troubleshooting, user interface design, and classroom assistance.

**MTA-Sztaki (Hungarian Academy of Science), Dr. Gabor Sarkozy, Dr. Andras Kornai, March- May 2013:**

- Natural Language Processing: Created a method that automatically builds a sentence-level parallel corpus and a dictionary between Chinese, a high-density character-based language, and Hungarian, a medium-density word-based language.

## INDUSTRY EXPERIENCE

**SAS, Year-long Educational Analytics Intern, May 2017 - present**

- SAS e-learning courses are designed to teach SAS tool and languages, analytical and predictive methods to industry professionals.
- Derive actionable insights from SAS e-learning data.
- Involving in multiple SAS educational technology and educational content design projects.

**IBM Watson, Cognitive Software Engineer, May-Aug 2015**

- Watson for Oncology is a healthcare solution that analyzes patients' medical record against millions of medical literature sources to provide evidence-based treatment options.
- In a team of 5, designed and developed a tool that compares treatments' side effects. The product follows cognitive computing principles, adaptive to patients' preference, and pluggable to other Watson products. Actively involved designers and stakeholders in the design and agile development processes.
- Led patent writing and user study.

**NCSU, Teaching Assistant, Aug 2014 – Dec 2016**

Worked as head TA for Discrete Math. Led review sessions, and organized other teaching and grading activities in a timely manner.

**Dell Inc., Embedded Systems Engineering Intern, Apr - Aug 2013**

Programmed automated procedures to evaluate disk drive performance, and generate statistical report to help the team make informed decision on storage disk.

## PUBLICATIONS

### Journal Publications

**Liu, Z., Zhi, R., Hicks, A., Barnes, T. Understanding Problem Solving Behavior of 6-8 Graders in a Debugging Game** *Computer Science Education*. Taylor and Francis, UK. 2017.

### Peer-reviewed Publications in Conference Proceedings

**Liu, Z., Cody, C., Kessler, S., Barnes, T., Lynch, Rutherford, T. Using Serious Game Analytics to inform Digital Curricular Sequencing: What Math Objective Should Students Play Next?** *ACM SIGCHI Annual Symposium on Computer-Human Interaction in Play (CHI-PLAY)*. Amsterdam, the Netherlands. 2017. (full paper)

**Liu, Z., Cody, C., Barnes, T., Lynch, Rutherford, T. Antecedents of and Associations with Elective Replay in an Educational Game: Is Replay Worth It?** *International Conference on Educational Data Mining*. Wuhan, China. 2017. (full paper)

Price, T., **Liu, Z.**, Catete, C., Barnes, T. **Factors Influencing Students' Help-Seeking Behavior while Programming with Human and Computer Tutors.** *International Computing Educational Research Conference* Tacoma, USA. 2017. (full paper)

**Liu, Z., Brown, R., Lynch, C., Barnes, T. Baker, R.S.J.d., Bergner, Y., Mcnamara, D. Difference in MOOC Learning by Geographical Location.** *International Conference on Educational Data Mining*. Raleigh, USA. 2016. (full paper)

**[Best Student Paper Nominee] Hicks, A., Liu, Z., Barnes, T. Measuring Gameplay Affordances of User-Generated Content in an Educational Game.** *International Conference on Educational Data Mining*. Raleigh, USA. 2016. (full paper)

**Liu, Z., Mostafavi, B., Barnes, T. Combining Worked Examples and Problem Solving in a Data-driven Logic Tutor.** *International Conference on Intelligent Tutoring Systems*. Zagreb, Croatia. 2016. (short paper)

Mostafavi, B., **Liu, Z.**, Barnes, T. **Data-driven Proficiency Profiling.** *International Conference on Educational Data Mining*. Madrid, Spain, 2015. (full paper)

**Liu, Z., Pataranutaporn, V., Ocumpaugh, J., Baker, R.S.J.d. Sequences of Frustration and Confusion, and Learning.** *The 6th International Conference on Educational Data Mining*. Memphis, USA, 2013. (full paper)

### Technical Report

**Liu, Z., Zhang, Y., Kornai, A., Sárközy, G. Automated Building of Sentence-Level Parallel Corpus and Chinese-Hungarian Dictionary.** *Technical Report MQP-CDR-GXS1301*. Worcester Polytechnic Institute, 2013

### Extended Abstract and Posters

**Liu, Z., Barnes, T. Data-driven Hint Generation from Peer Debugging Solutions.** *International Conference on Educational Data Mining*. Madrid, Spain, 2015. (Doctorial Consortium)

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## SERVICE & INVOLVEMENT

**Reviewer:** International Conference on Educational Data-Mining (EDM), Learning@Scale (L@S), Intelligent Tutoring Systems (ITS), International Journal for Artificial Intelligence in Education (IJAIED), IEEE Transactions on Games.

**Outreach:** Led NC State's MSEN Middle School Computer Science Outreach Program

**Organization:** International Honor Society for the Computing and Information Disciplines Member (UPE), Women in Computer Science (WICS), Grace Hopper Scholar (GHC), Students & Technology in Academia, Research and Service (STARS), Alpha Gamma Delta International Sorority (AGD)