Jieqiong Zhao

Ph.D. in Electrical and Computer Engineering

zhao413@purdue.edu +1-857-221-2012

Purdue University, West Lafayette, IN https://jieqiongzhao.github.io

Research Interests : Visual analytics, information visualization, human-computer interaction, applied artificial intelligence and machine learning, human computation and crowdsourcing

Education

	Purdue University, West Lafayette, IN
Jun 2013-May 2020	**Ph.D.** in Electrical and Computer Engineering
	○ Advisor : David S. Ebert
	○ Committee members : Niklas Elmqvist, Edward Delp, Melba M. Crawford, Alex Quinn
	○ Thesis : Visual analytics for decision making in performance evaluation
	Tufts University, Medford, MA
Sep 2011-May 2013	**M.S.** of Computer Science
	○ Advisor : Remco Chang
	○ Project : Modeling user interactions for complex visual search tasks
	Zhejiang University of Technology, Hangzhou, China
Sep 2010-Jun 2011	**M.S. Candidate** in Computer Science and Technology
Sep 2006-Jun 2010	**Bachelor of Engineering** in Software Engineering
	○ Advisor : Xujia Qin
	○ Thesis : Natural scene construction and rendering of rain and snow

Honors and Awards

2015	Honorable Mention for Compelling Narrative Debrief of VAST Challenge, IEEE
May 2010	Excellent Graduate awarded by Zhejiang Provincial Higher Education Council
2007, 2008, 2009	Excellent Student Scholarship awarded by Zhejiang University of Technology
Nov 2008	Outstanding Student awarded Zhejiang University of Technology

Publications

Journal Papers

J6. **J. Zhao**, M. Karimzadeh, L. S. Snyder, C. Surakitbanharn, Z. C. Qian, and D. S. Ebert. MetricsVis : A visual analytics system for evaluating employee performance in public safety agencies. *IEEE Transactions on Visualization and Computer Graphics*, 26(1):1193–1203, Jan 2020. doi : 10.1109/TVCG.2019.2934603 [Acceptance rate : 24.7%, 42/170]

J5. M. Khayat, M. Karimzadeh, **J. Zhao**, and D. S. Ebert. VASSL : A visual analytics toolkit for social spambot labeling. *IEEE Transactions on Visualization and Computer Graphics*, 26(1):874–883, Jan 2020. doi : 10.1109/TVCG.2019.2934266 [Acceptance rate : 24.7%, 42/170]

J4. L. Tay, V. Ng, A. Malik, J. Zhang, J. Chae, D. S. Ebert, Y. Ding, **J. Zhao**, and M. Kern. Big data visualizations in organizational science. *Organizational Research Methods*, 21(3):660–688, 2018. doi : 10.1177/1094428117720014

J3. Y. L. Wong, **J. Zhao**, and N. Elmqvist. Evaluating social navigation visualization in online geographic maps. *International Journal of Human–Computer Interaction*, 31(2):118–127, 2015. doi : 10.1080/10447318.2014.959106

J2. S. Ko, **J. Zhao**, J. Xia, S. Afzal, X. Wang, G. Abram, N. Elmqvist, L. Kne, D. Van Riper, K. Gaither, S. Kennedy, W. Tolone, W. Ribarsky, and D. S. Ebert. VASA : Interactive computational steering of large asynchronous simulation pipelines for societal infrastructure. *IEEE Transactions on Visualization and Computer Graphics*, 20(12):1853–1862, Dec 2014. doi : 10.1109/TVCG.2014.2346911 [Acceptance rate : 24.7%, 33/146]

J1. E. T. Brown, A. Ottley, **H. Zhao**, Q. Lin, R. Souvenir, A. Endert, and R. Chang. Finding waldo : Learning about users from their interactions. *IEEE Transactions on Visualization and Computer Graphics*, 20(12):1663–1672, Dec 2014. doi : 10.1109/TVCG.2014.2346575 [Acceptance rate : 24.7%, 33/146]

Conference Papers

C6. **J. Zhao**, M. Karimzadeh, H. Xu, A. Malik, S. Afzal, G. Wang, N. Elmqvist, and D. S. Ebert. Route Packing : Geospatially-accurate visualization of route networks. In *Proceedings of the Hawaii International Conference on System Sciences*, HICSS-53, pp. 1370–1379. ScholarSpace, January 2020. doi : 10.24251/HICSS.2020.168 [Acceptance rate : 47%]

C5. **J. Zhao**, M. Karimzadeh, A. Masjedi, T. Wang, X. Zhang, M. M. Crawford, and D. S. Ebert. FeatureExplorer : Interactive feature selection and exploration of regression models for hyperspectral images. In *Proceedings of the IEEE Visualization Conference*, VIS 2019, pp. 161–165. IEEE, Oct 2019. doi : 10.1109/VISUAL.2019.8933619 [Acceptance rate : 31.7%, 59/186]

C4. A. Masjedi, **J. Zhao**, A. M. Thompson, K. Yang, J. E. Flatt, M. M. Crawford, D. S. Ebert, M. R. Tuinstra, G. Hammer, and S. Chapman. Sorghum biomass prediction using UAV-based remote sensing data and crop model simulation. In *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium*, IGARSS 2018, pp. 7719–7722. IEEE, July 2018. doi : 10.1109/IGARSS .2018.8519034

C3. Z. Zhang, A. Masjedi, **J. Zhao**, and M. M. Crawford. Prediction of sorghum biomass based on image based features derived from time series of UAV images. In *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium*, IGARSS 2017, pp. 6154–6157. IEEE, July 2017. doi : 10.1109/IGARSS.2017.8128413

C2. **J. Zhao**, A. Malik, H. Xu, G. Wang, J. Zhang, C. Surakitbanharn, and D. S. Ebert. MetricsVis : A visual analytics framework for performance evaluation of law enforcement officers. In *Proceedings of the IEEE International Symposium on Technologies for Homeland Security*, HST 2017, pp. 1–7. IEEE, April 2017. doi : 10.1109/THS.2017.7943468

C1. S. K. Badam, **J. Zhao**, S. Sen, N. Elmqvist, and D. Ebert. TimeFork : Interactive prediction of time series. In *the ACM Conference on Human Factors in Computing Systems*, CHI '16, pp. 5409–5420. ACM, 2016. doi : 10.1145/2858036.2858150 [Acceptance rate : 23.2%, 565/2435]

Posters

P7. W. Hatton, **J. Zhao**, M. B. Gorantla, J. Chae, B. Ahlbrand, H. Xu, S. Chen, G. Wang, J. Zhang, A. Malik, S. Ko, and D. S. Ebert. Visual analytics for detecting communication patterns. In *Proceedings of the IEEE Conference on Visual Analytics Science and Technology*, pp. 137–138. IEEE, Oct 2015. doi : 10.1109/VAST.2015.7347648 **VAST Challenge 2015 MC2 Honorable Mention** ★

P6. **J. Zhao**, G. Wang, J. Chae, H. Xu, S. Chen, W. Hatton, S. Towers, M. B. Gorantla, B. Ahlbrand, J. Zhang, A. Malik, S. Ko, and D. S. Ebert. ParkAnalyzer : Characterizing the movement patterns of visitors VAST 2015 mini-challenge 1. In *Proceedings of the IEEE Conference on Visual Analytics Science and Technology*, pp. 179–180. IEEE, Oct 2015. doi : 10.1109/VAST.2015.7347669

P5. J. Chae, G. Wang, B. Ahlbrand, M. B. Gorantla, J. Zhang, S. Chen, H. Xu, **J. Zhao**, W. Hatton, A. Malik, S. Ko, and D. S. Ebert. Visual analytics of heterogeneous data for criminal event analysis VAST challenge 2015 : Grand challenge. In *Proceedings of the IEEE Conference on Visual Analytics Science and Technology*, pp. 149–150. IEEE, Oct 2015. doi : 10.1109/VAST.2015.7347654

P4. S. K. Badam, **J. Zhao**, N. Elmqvist, and D. S. Ebert. TimeFork : Mixed-initiative time-series prediction. In *Proceedings of the IEEE Conference on Visual Analytics Science and Technology*, pp. 223–224. IEEE, Oct 2014. doi : 10.1109/VAST.2014.7042501

P3. J. Xia, **J. Zhao**, I. Sheeley, J. Christopher, Q. Wang, C. Guo, J. Zhang, D. S. Ebert, Y. V. Chen, and Z. C. Qian. AnnotatedTime-Tree : Visualization and annotation of news text and other heterogeneous document collections. In *Proceedings of the IEEE Conference on Visual Analytics Science and Technology*, pp. 337–338. IEEE, Oct 2014. doi : 10.1109/VAST.2014.7042554

P2. C. Guo, J. Xia, J. Yu, **J. Zhao**, J. Zhang, Q. Wang, Z. C. Qian, Y. V. Chen, C. Wang, and D. Ebert. AnnotatedTimeTree, Dodeca-Rings Map & SMART : A geo-temporal analysis of criminal events. In *Proceedings of the IEEE Conference on Visual Analytics Science and Technology*, pp. 303–304. IEEE, Oct 2014. doi : 10.1109/VAST.2014.7042538

P1. **J. Zhao**, Q. Lin, A. Ottley, and R. Chang. Modeling user interactions for complex visual search tasks. In *Proceedings of the IEEE Conference on Visual Analytics Science and Technology*. IEEE, Oct 2013. jieqiongzhao.github.io/assets/data/waldo13.pdf

Research Experience

Purdue University VACCINE Lab
Graduate Research Assistant with Prof. David S. Ebert — 2013-Present

2016-Present **FeatureExplorer : Visual Analytics for Automated Sorghum Phenotyping and Trait Development**
Visualizing the remote sensing data collected by a UAV-based platform. Incorporating the feature engineering pipeline of remote sensing experts to improve the prediction for phenotypic traits of energy crops.

- Utilized remote sensing collected hyperspectral images to predict the biomass of sorghum varieties in smart agriculture applications
- Incorporated various regression models (e.g., SVR, lasso, PLSR, random forest) in predictive analysis and provided performance comparisons using different subsets of features
- Integrated multiple feature ranking algorithms to expedite identification of features contribute significantly to prediction
- Relevant publications : C5, C4, C3

2015-Present **MetricsVis : Employee Performance Evaluation and Analysis for Law Enforcement Officers**
Collaboration with local law enforcement officers to exploit their automatically logged activity records. Utilizing dynamic evaluation metrics to understand the impact of behavior types, shifts, and patrol districts.
- Applied pairwise learning-to-rank algorithms to relate supervisors' subjective ratings to the quantitative measurements of employee achievements
- Used the rating of multiple supervisors to understand the potential biases or preferences between supervisors, and improve the fairness of evaluation in the future
- Relevant publications : J6, J4, C2

2014-2015 **Route Packing : Geospatially-accurate visualization of route networks**
Displaying several routes simultaneously on a geographic map while preserving the geospatial layout, identity, directionality, and volume of individual routes.
- Applied linear kernel density estimation and thinning algorithm to extract the skeleton of route network and adopted metro-line crossing minimization algorithm to reduce visual clutter
- Conducted a crowdsourced user study to investigate route tracing performance with road networks visualized using the route packing technique with different visual parameters
- Relevant publication : C6

2013-2014 **VASA : Interactive computational steering of large asynchronous simulation pipelines for infrastructure**
Designing a workbench connects with several distributed servers that modeling the impact of societal threats such as weather, food contamination, and traffic on critical infrastructure such as supply chains, road networks, and power grids.
- Developed a visual analytics framework to support asynchronous simulation pipeline of severe weather, critical infrastructure, and supply chain
- Integrated high precision distributed simulation models and coarse local approximations
- Relevant publication : J2

Tufts University VALT Lab
Master Project with Prof. Remco Chang 2011-2013

2011-2013 **Modeling User Interactions for Complex Visual Search Tasks**
Investigating the interaction patterns of users while performing search tasks. Utilized *Where's Waldo* as a representative example of visual complex search task.
- Performed an online user study to collect users' mouse interactions during search task
- Extracted mouse interaction features using n-grams and then classified users' search strategies by decision trees and SVM
- Relevant publications : J1, P1

Teaching Experience

Fall 2018 **Teaching Assistant for Purdue's Introduction to Visual Analytics**
- Prepared paper reading list for prominent topics in visual analytics
- Graded paper summaries, course project papers and peer reviews, and exams
- Advised students on course projects

Spring 2012 **Teaching Assistant for Tufts's Introduction to Programming for Business**
- Monitored labs for Visual Basic NET framework application, VBA Macro for EXCEL
- Prepared tutorials for labs and assignments; graded codes and exams

Professional Services

Conference Reviewer

IEEE Transactions on Visualization and Computer Graphics (IEEE VIS)
The Eurographics Conference on Visualization (EuroVis)
The IEEE Pacific Visualization Symposium (PacificVis)
Hawaii International Conference on System Sciences (HICSS)

Student Volunteer

IEEE VIS 2019 Student Volunteer