Hong Wang

Tel: (702) 773-5501
Home Page: https://kenns29.github.io/personal_site/
Email: kennsmacintosh@gmail.com
LinkedIn: https://www.linkedin.com/in/hong-wang-2a133854
Citizenship: United States

SUMMARY

An experienced software engineer: skilled in full-stack web development, database management, data mining, as well as visualization design and development.

WORK EXPERIENCE

Uber
Software Engineer II 07/2019 – Present

- Worked as a full-stack web developer and visualization developer.
- Consolidated and reimplemented the frontend of a suite of internal machine learning (ML) platforms
  - Implemented a suite of backend APIs to organize models, files, and workflows across different ML platforms.
  - Implemented the frontend for displaying and organizing the models, files, and workflows.
- Carried out a user study to understand the use cases of the internal ML platforms
- Implemented the search functionality for the Jupyter notebooks shared in the internal platform
  - Collaborated with a backend engineer.
  - Implemented search APIs leveraging the internal search framework.
  - UI/UX enhancement for displaying the searched notebooks.
- Improved and maintained the frontend of an internal Jupyter notebook hosting platform
  - Refactored the entire codebase to use the FusionJS framework, as well as modernizing the React usage.
  - UI/UX improvement for the notebook sharing process.
- Developed a visualization for displaying the results of causal models
  - Collaborated with a data scientist and several engineers.
  - Implemented the visualization in Javascript and enabled it to be used in Jupyter notebooks as a Python library.
- Built a Jupyter Python wrapper for a Javascript visualization library
  - Can be found at https://pypi.org/project/mlvis/
- **Technology Used:** *Javascript, ReactJS, Redux, GraphQL, Python, Jupyter, Go, MySQL*

Uber
Software Engineer Intern 05/2018 – 08/2018

- Worked as a visualization developer and full-stack web developer.
- Collaborated with multiple senior data scientists.
- Project: A Visual Analytics System for Causality Analysis
  - Designed and developed a visual analytics system to help incorporate human knowledge in causality analysis.
  - Worked as the sole developer for this project and implemented both the backend server and the frontend views.
  - The system performed Bayesian network learning and hierarchical clustering in the Python backend and allowed interactions with the models through the visualizations in the frontend.
- Project: An Embedding Visualization Tool
  - Implemented an embedding visualization system using the deck.gl Javascript library.
- Contributed to the deck.gl Javascript library by implementing two experimental InfoVis layers.
  Technology Used: *Javascript, ReactJS, Redux, Deck.gl, Python, Flask*

Pacific Northwest National Laboratory
PhD Research Intern 05/2017 – 04/2018

- Worked as a visualization researcher and full-stack web developer.
- Collaborated with visualization research scientists and climate scientists.
- Project: A Visual Analytics System for Climate Model Comparison
  - Designed and developed a web-based visual analytics system to help climate scientists compare the model performances between a large number of models.
  - Implemented a scalable visual analytic framework integrating various visualization techniques, such as parallel coordinate plots, histogram, etc.
  - Published a research paper about this work in the InfoVis conference.

  Technology Used: *Javascript, ReactJS, Redux, D3.js, NodeJS, Express, MongoDB*

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Arizona State University
Graduate Research Assistant 07/2014 – 06/2019

EDUCATION

Computer Science, PhD GPA: 3.75 05/2019
Arizona State University
Adviser: Ross Maciejewski

Computer Science, B.S. GPA: 3.66 05/2013
University of Nevada, Las Vegas

SKILL HIGHLIGHTS

Programming Languages: Javascript, Java, Python, Go, C/C++, Matlab
Libraries/Frameworks: React, Redux, GraphQL, NodeJS, Tomcat, D3.js, OpenGL
Databases: MySQL, PostgreSQL, MongoDB

SELECTED RESEARCH PROJECTS

Project demos can be found at https://kenns29.github.io/personal_site/

A Visual Analytics Framework for Spatial Temporal Trade Network Analysis 2017

- Lead a team of three graduate students to build a visual analytics system utilizing web technologies.
- Calculated various network properties from a global trade network data, and applied Pearson correlation to identify the network properties that highly correlated with the political stability measures.
- Detect anomalous changes over time in each country's network property and political stability measures.
- Used multiple coordinated views to allow the users to explore the dataset interactively.

Technology Used: *Javascript, Java, HTML, D3.js, Tomcat, MySQL*

A Visual Analytics Framework for Identifying Topic Drivers in Media Events 2016

- Built a web-based visual analytics system using Javascript, D3.js, Java, Tomcat and MongoDB.
- Developed a semantic keyword search model to search and connect the textual data from two datasets.
- Implemented the hierarchical clustering algorithm on Javascript to group keywords by their semantic meanings, and implemented a force directed layout to display the clusterings and allowed the drag-and-drop interaction on the layout to refine the clusterings.
- Implemented the Granger Causality method to detect the cause-effect relationships and visualized the results on a timeline with optional annotations.

Technology Used: *Javascript, Java, HTML, D3.js, Tomcat, MongoDB*

SELECTED SIDE PROJECTS

A Simple Visualization Brushing Library to be Used in React

- Can be found at https://www.npmjs.com/package/react-svg-brush

PUBLICATIONS

- **H. Wang**, Y. Lu, S. T. Shutters, M. Steptoe, F. Wang, S. Landis, R. Maciejewski, "A Visual Analytics Framework for Spatiotemporal Trade Network Analysis," in *IEEE Transactions on Visualization and Computer Graphics*, vol. 25, no. 1, pp. 331-341, Jan. 2019.
- A. Dasgupta, **H. Wang**, N. O'brien, S. Burrows, "Separating the Wheat from the Chaff: Comparative Visual Cues for Transparent Diagnostics of Competing Models," in *IEEE Transactions on Visualization and Computer Graphics*, vol. 26, no. 1, pp. 1043-1053, Jan. 2020.
- Y. Lu, **H. Wang**, S. Landis, R. Maciejewski, "A Visual Analytics Framework for Identifying Topic Drivers in Media Events," in *IEEE Transactions on Visualization and Computer Graphics,* vol. 24, no. 9, pp. 2501-2515, Sept. 2018
- Y. Lu, M. Steptoe, S. Burke, **H. Wang**, J. Tsai, H. Davulcu, D. Montgomery, S. R. Corman, R. Maciejewski, "Exploring Evolving Media Discourse Through Event Cueing," in *IEEE Transactions on Visualization and Computer Graphics*, vol. 22, no. 1, pp. 220-229, Jan. 2016.
- C. M. Whisner, **H. Wang**, S. Felix, R. Maciejewski, "Mining the Twitter-Sphere for Consumer Attitudes Towards Dairy," in *The FASEB Journal*, vol. 30 no. 1. (Abstract)