Zijie Jay Wang

https://zijie.wang jayw@gatech.edu

Education

Georgia Institute of Technology — *Atlanta, GA*
Ph.D. in Machine Learning — *Aug. 2019 — Present*
Advisor: Duen Horng (Polo) Chau

University of Wisconsin–Madison — *Madison, WI*
Bachelor of Science (B.S.), GPA: 3.95/4.00 — *Sept. 2015 — May 2019*
Majors: Computer Sciences (Honor), Statistics (Honor), Mathematics
Thesis: Classifying T Cell Activity with Convolutional Neural Networks
Advisors: Anthony Gitter, Michael Gleicher, Yu Hen Hu

Academic Research Experience

Georgia Institute of Technology — *Atlanta, GA*
Ph.D. Researcher, School of Computational Science and Engineering — *Aug. 2019 — Present*
Mentor: Duen Horng (Polo) Chau
Member of the Polo Club of Data Science where we innovate scalable, interactive, and interpretable tools that amplify human's ability to understand and interact with billion-scale data and machine learning models.

Morgridge Institute for Research — *Madison, WI*
Undergraduate Researcher, John W. and Jeanne M. Rowe Center for Research in Virology — *Dec. 2017 — Aug. 2019*
Mentor: Anthony Gitter
Classify T-cell and breast cancer cell types using fluorescent images with machine learning classifiers with a gradient of complexity. Interpre feature representations of each classifiers. Analyze about 1 million 5-channel cell-painting images of bone tumor cells. Explore latent space between image space and chemical molecule space.

University of Wisconsin–Madison — *Madison, WI*
Undergraduate Researcher, Department of Computer Sciences — *Dec. 2018 — June 2019*
Mentor: Michael Gleicher
Design and develop a visual analytics tool for recommender system resaerchers. Interactively visualized user-item rating matrix with statistics-conditioned sub-sampling to spot abnormal ratings and predictions.

University of Wisconsin–Madison — *Madison, WI*
Research Assistant, Electrical & Computer Engineering — *Feb. 2017 — Dec. 2017*
Mentor: Yu Hen Hu
Study how to track car driver's head position and orientation from low-qualitytraffic video. Develop semi-automatic video annotation software with Viola-Jones frontal facedetector for training object tracking algorithms. Implement real-time face tracking algorithms on iOS devices. Train a facial reenactment model using GANs and port it to iOS device.

Industry Research Experience

Bosch Research — *Sunnyvale, CA*
Research Intern, Human–Machine Interaction — *June 2020 — Aug. 2020*
Mentor: Liang Gou
Research and develop explainable machine learning models and visual analytics solutions to help autonomous driving domain experts understand and control adversarial case generation for object recognition.

Publications

CNN Explainer: Learning Convolutional Neural Networks with Interactive Visualization

Zijie J. Wang, Robert Turko, Omar Shaikh, Haekyu Park, Nilaksh Das, Fred Hohman, Minsuk Kahng, Duen Horng (Polo) Chau
IEEE Transactions on Visualization and Computer Graphics (TVCG). Salt Lake City, UT, USA, 2021.
Project Demo Video PDF Code (★ 5016) BibTeX Top of GitHub Trending

Bluff: Interactively Deciphering Adversarial Attacks on Deep Neural Networks

Nilaksh Das*, Haekyu Park*, **Zijie J. Wang**, Fred Hohman, Robert Firstman, Emily Rogers, Duen Horng (Polo) Chau
IEEE Visualization Conference (VIS). Salt Lake City, UT, USA, 2020.
Project Demo PDF Code BibTeX (* Authors contributed equally)

A Comparative Analysis of Industry Human-AI Interaction Guidelines

Austin P. Wright, **Zijie J. Wang**, Haekyu Park, Grace Guo, Fabian Sperrle, Mennatallah El-Assady, Alex Endert, Daniel Keim, Duen Horng (Polo) Chau

IEEE Visualization Conference, Workshop on Trust and Expertise in Visual Analytics (TREX). Salt Lake City, UT, USA, 2020.

Project Demo PDF Code BibTeX

Mapping Researchers with PeopleMap

Jon Saad-Falcon, Omar Shaikh, **Zijie J. Wang**, Austin P. Wright, Sasha Richardson, Duen Horng (Polo) Chau

Poster, IEEE Visualization Conference (VIS). Salt Lake City, UT, USA, 2020.

Project Demo PDF Code (★ 32) BibTeX **Best Poster Research Award, Honorable Mention**

Argo Lite: Open-Source Interactive Graph Exploration and Visualization in Browsers

Siwei Li, Zhiyan Zhou, Anish Upadhayay, Omar Shaikh, Scott Freitas, Haekyu Park, **Zijie J. Wang**, Susanta Routray, Matthew Hull, Duen Horng (Polo) Chau

The Conference on Information and Knowledge Management (CIKM). Galway, Ireland, 2020.

Project Demo PDF Code (★ 29) BibTeX

UnMask: Adversarial Detection and Defense Through Robust Feature Alignment

Scott Freitas, Shang-Tse Chen, **Zijie J. Wang**, Duen Horng (Polo) Chau

IEEE International Conference on Big Data (BigData). Los Angeles, CA, USA, 2020.

Project PDF Code BibTeX

Massif: Interactive Interpretation of Adversarial Attacks on Deep Learning

Nilaksh Das*, Haekyu Park*, **Zijie J. Wang**, Fred Hohman, Robert Firstman, Emily Rogers, Duen Horng (Polo) Chau

Extended Abstracts on ACM Human Factors in Computing Systems (CHI). Honolulu, HI, USA, 2020.

Project PDF BibTeX (* Authors contributed equally)

CNN 101: Interactive Visual Learning for Convolutional Neural Networks

Zijie J. Wang, Robert Turko, Omar Shaikh, Haekyu Park, Nilaksh Das, Fred Hohman, Minsuk Kahng, Duen Horng (Polo) Chau

Extended Abstracts on ACM Human Factors in Computing Systems (CHI). Honolulu, HI, USA, 2020.

Project Video PDF BibTeX

Classifying T cell activity in autofluorescence intensity images with convolutional neural networks

Zijie J. Wang, Alex J. Walsh, Melissa C. Skala, Anthony Gitter

Journal of Biophotonics (J. Biophotonics). 2019.

Project PDF Slides Code Data BibTeX

Classifying T cell activity with convolutional neural networks

Zijie J. Wang, Alex J. Walsh, Melissa C. Skala, Anthony Gitter

International Society for Computational Biology Great Lakes Bioinformatics Conference (ISCB GLBIO). Madison, WI, USA, 2019.

Project PDF BibTeX

Using Transfer Learning to Classify Breast Cancer Cells with Fluorescence Imaging

Zijie J. Wang, Tiffany M. Heaster, Quan Yin, Alex J. Walsh, Melissa C. Skala, Anthony Gitter

University of Wisconsin–Madison Undergraduate Symposium. 2018.

Project PDF BibTeX

Invited Talks

CNN Explainer: Learning Convolutional Neural Networks with Interactive Visualization

IEEE Visualization Conference — *Oct. 2020*

Deepkapha LiveAI — *Aug. 2020*

Classifying T cell activity with convolutional neural networks

Out in Science, Technology, Engineering, and Mathematics (oSTEM) Conference — *Nov. 2019*

UW–Madison Senior Honors Thesis Symposium — *April 2019*

Grants and Awards

Dean's List

Aug. 2015 – May 2019

Achieved at least a 3.60 GPA as freshmen and sophomores, a 3.85 GPA as juniors and seniors.

University Book Store Academic Excellence Award ($1000)

May 2019

An award recognizing undergraduate students who have completed an outstanding independent project, such as a senior thesis.

Honors Senior Thesis Summer Research Grant ($3000)

June 2018

A research grant funding students to undertake more demanding and extensive senior thesis research projects.

Welton Summer Sophomore Apprenticeship ($2500)

June 2017

A research grant awarded to talented students to participate in actual, cutting-edge research.

Teaching

Graduate Teaching Assistant

Atlanta, GA

Georgia Institute of Technology

Aug. 2020 — Dec. 2020

Data & Visual Analytics (CSE 6242) , Instructor: Duen Horng (Polo) Chau

Lead homework designs for data visualizations, hold weekly office hours, and answer student questions on Piazza. The course had 1277 graduate students enrolled.

Undergraduate Teaching Assistant

Madison, WI

University of Wisconsin–Madison

Dec. 2018 — May 2019

Computer Graphics (CS 559) , Instructor: Michael Gleicher

Create course notes and weekly assignments, hold weekly office hours, and answer student questions on Piazza. The course had 180 undergraduates enrolled.

Notetaker

Madison, WI

University of Wisconsin–Madison

Sep. 2016 — May 2019

McBurney Disability Resource Center

Provide clearly-written math and statistics notes to students with disability, answer course-related questions.

Academic Coach

Madison, WI

University of Wisconsin–Madison

Nov. 2016 — May 2017

Division of Diversity, Equity and Educational Achievement

Mentor undergraduate students in DDEEA programs for Data Structure course, design two worksheets and provided detailed solutions every week.

Tutor

Madison, WI

University of Wisconsin–Madison

Jan. 2016 — Jan. 2017

Greater University Tutoring Service

Instruct peers one-on-one in programming and math problems for three hours weekly, lead review sections to help students study for calculus exams.

Mentoring

Jon Saad-Falcon

May 2020 — Present

B.S. in Computer Science, Georgia Institute of Technology

Robert Turko

Aug. 2019 — Present

B.S. in Computer Science, Georgia Institute of Technology

PURA Travel Award (2020)

Omar Shaikh

Aug. 2019 — Present

B.S. in Computer Science, Georgia Institute of Technology

Outstanding Freshman Award (2020)

Service

Reviewer

IEEE Visual Analytics Science and Technology (**VAST**) 2020

ACM Conference on Information and Knowledge Management (**CIKM**) 2020

Journal of Open Source Software (**JOSS**) 2020

Member

Institute of Electrical and Electronics Engineers (**IEEE**) — *July 2019 — Present*

Association for Computing Machinery (**ACM**) — *Dec. 2019 — Present*

Skills

Programming

Python, JavaScript, Swift, R, Julia, PyTorch, TensorFlow, Keras, HTML, CSS, LaTeX, SQL, C++, Git

Design

Affinity Designer, Affinity Photo, Final Cut Pro, Sketch, Keynote, Illustrator, Photoshop

HCI

Think-aloud protocol, User Personas, Rapid Paper Prototyping, Affinity Diagraming

References

Polo Chau, Associate Professor
School of Computational Science and Engineering
Georgia Institute of Technology
https://cc.gatech.edu/~dchau/

Liang Gou, Principal Research Scientist
Human–Machine Interaction
Bosch Research
https://www.linkedin.com/in/lianggou/

Anghony Gitter, Assistant Professor
Department of Biostatistics and Medical Informatics
University of Wisconsin–Madison
https://www.biostat.wisc.edu/~gitter/

Michael Gleicher, Professor
Department of Computer Sciences
University of Wisconsin–Madison
http://pages.cs.wisc.edu/~gleicher/