Zijie (Jay) Wang

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Research Interests

Machine Learning interpretability, fairness and security, visual analytics, and biomedical image analysis.

Education

Aug 2019 to Present
Georgia Institute of Technology, Atlanta, GA
Ph.D. in Machine Learning
Advisor: Polo Chau

Sept 2015 to May 2019
University of Wisconsin - Madison, Madison, WI
Bachelor of Science (B.S.)
Majors: Computer Sciences (Honors), Statistics (Honors), Mathematics
Overall GPA: 3.95/4.00

Research Experience

Dec 2017 to Aug 2019
Madison, WI

Undergraduate Researcher at **Morgridge Institute for Research**
Advisor: Anthony Gitter

Cell Image Classification

- Classify T-cell and breast cancer cell types using fluorescent images
- Compare and analyze various classifiers: logistic regression, fully connected neural network, convolutional neural network and transfer learning
- Interpret feature representations from different learning layers in the transfer learning model

Cell Painting and Drug Discovery

- Analyze about 1 million 5-channel cell-painting images of bone tumor cells
- Explore latent space between the image space and chemical molecule space
- Study how to remove batch effects of microscopy images at scale

Feb 2017 to Dec 2017
Madison, WI

Research Assistant at **Electrical and Computer Engineering Department**
Advisor: Yu Hen Hu

Video Object Tracking

- Study how to track car driver's head position and orientation from low-quality traffic video
- Develop semi-automatic video annotation software with Viola-Jones frontal face detector for training object tracking algorithms

Facial Reenactment

- Implement real-time face tracking algorithms on iOS devices
- Train a facial reenactment model using GANs and port it to iOS devices

Paper Under Review

Zijie J. Wang, Alex J. Walsh, Melissa C. Skala, Anthony Gitter. *bioRxiv 2019.* Classifying T cell activity in autofluorescence intensity images with convolutional neural networks.

Poster Presentation and Talk

Zijie J. Wang, Alex J. Walsh, Melissa C. Skala, Anthony Gitter. Classifying T cell activity with convolutional neural networks. (Presented in ISCB GLBIO 2019)

Zijie J. Wang, Alex J. Walsh, Melissa C. Skala, Anthony Gitter. Using Transfer Learning to Classify Breast Cancer Cells with Fluorescence Imaging.(Presented in UW-Madison Undergraduate Symposium 2018)

Zijie J. Wang, Tiffany Heaster, Quan Yin, Alex J. Walsh, Melissa C. Skala, Anthony Gitter. Classifying T cell activity with convolutional neural networks . (Presented in UW–Madison Senior Honors Thesis Symposium 2018)

Teaching Experience

Jan 2019 to May 2019
Madison, WI

Peer Mentor at **UW–Madison Computer Sciences**

- Undergraduate teaching assistant for Computer Graphics (CS 559)
- Help professor create course notes and weekly assignments
- Host office hours and answer student questions on Piazza

Jan 2016 to Jan 2017
Madison, WI

Tutor at **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

Nov 2016 to May 2017
Madison, WI

Tutor at **Division of Diversity, Equity and Educational Achievement**

- Mentor undergraduate students in DDEEA programs for Data Structure course
- Design two worksheets and give detailed solutions every week

Awards and Grants

May 2019 | **University Book Store Academic Excellence Award**
An award recognizing undergraduate students who have completed an outstanding independent project, such as a senior thesis, at the University of Wisconsin–Madison

June 2018 | **Honors Senior Thesis Summer Research Grant**
A research grant funding students to undertake more demanding and extensive senior thesis research projects

June 2017 | **Welton Summer Sophomore Apprenticeship**
A research grant awarded to talented students to participate in actual, cutting-edge research

Course Projects

Spring 2018 | **Group Assignment Optimization**
Instructor: Laurent Lessard

- Course project for Introduction to Optimization, selected as the best project
- Design a mixed integer quadratic programming model to help Professor Ben Liblit improve group assignment in his Software Engineering class

Spring 2017 | **Madison Restaurant Yelp Ratings Prediction**
Instructor: Hyunseung Kang

- Course project for Applied Regression Analysis, won the in-class Kaggle Challenge
- Use Yelp comment texts to predict the categorical rating
- Explore multiple models including neural network with GloVe word representation

Related Courses

Computer Science:	Deep Learning, Artificial Intelligence, Computer Graphics, Operating System
Statistics:	Mathematical Statistics, Multivariate Analysis, Experiment Design
Mathematics:	Nonlinear Optimization, Real Analysis, Stochastic Processes

Programming Skills

Languages:	Python, R, JavaScript, Julia, Swift, LaTeX, C++, C, SQL
Packages:	Keras, Tensorflow, PyTorch, D3.js, scikit-learn, OpenCV, CellProfiler