

Qianwen Wang

Data Visualization + Machine Learning

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EDUCATION

Harvard University	MA, USA
PostDoc Researcher, Department of Biomedical Informatics	
Supervisor: Prof. Nils Gehlenborg	2020 -
Hong Kong University of Science and Technology	Hong Kong, China
PhD, Electronic and Computer Engineering	
Supervisor: Prof. Huamin Qu	2015 - 2020
Xi'an Jiao Tong University	Shaanxi, China
BEng., Electronic Science & Technology	2011 - 2015

RESEARCH VISITS AND INTERNSHIPS

Oxford University, Department of Engineering Science	Oxford, UK
Research Visiting Student, supervised by Prof. Min Chen	Aug 2019 - Dec 2019
Tsinghua University, School of Software	Beijing, China
Research Visiting Student, supervised by Prof. Shixia Liu	2017 - 2018
Microsoft Research	Beijing, China
Research Intern	2017 - 2018

RESEARCH INTERESTS

As a visualization researcher, I contribute interactive tools to promote **Human-AI collaboration**, with a focus on **biomedical applications**. Going beyond the common algorithm-centric methods, my studies contribute **interactive visual explanations** that incorporate the feedback of users and the characteristics of tasks. These studies enable users to generate domain-meaningful insights from AI, improve AI with human domain knowledge, and thus solve complicated domain problems.

AWARDS AND FUNDS

Best Paper Honorable Mention, IEEE VIS	2022
Postdoctoral Fellows Research Fund, Harvard Data Science Initiative	
Three awardees in Harvard University	2022
Best Long Abstract Award, ISMB BioVis COSI	
Top 1 out of all submissions	2022
Best Paper Award, IMLH@ICML	
Top 2 out of 39 accepted papers	2021
Best Abstract Award, ISMB BioVis COSI	
Top 1 out of all submissions	2021
SENG Academic Award, HKUST	
From more than 200 PhD students in the School of Engineering	2019
IEEE VIS Doctoral Colloquium, IEEE VIS	
	2019
Oversea Research Award, HKUST	
	2019
Award of Excellence, Microsoft Research Internship Program	
	2018
Award of Most Feasibility, Microsoft One Week Hackathon	
	2017
Outstanding Graduates Xi'an Jiao Tong University	
	2015
Educational Scholarship, Xi'an Jiao Tong University	
	2012-2014

PROFESSIONAL SERVICE

Organizing Committee

Poster Chair, IEEE Pacific Visualization Symposium	2023
Abstract Chair, International Conference on Intelligent Systems for Molecular Biology	2022-2023
Organizer, Visualization in Biomedical AI Workshop @ IEEE VIS	2022
Organizer, Tutorial @ ISMB	2022
Building Interactive Visualizations of Genomics Data with Gosling	2022

Program Committee

IEEE VIS Conference	2023
ACM Conference on Intelligent User Interfaces	2023
IEEE Pacific Vis 2022 Visualization Meets AI Workshop	2022
ChinaVis Conference	2022

Conference Paper Review

IEEE VIS Conference	2018-2022
ACM CHI Conference on Human Factors in Computing Systems	2019-2023
ACM Conference on Intelligent User Interfaces	2020-2022
EuroVis Conference	2019-2023
ChinaVis Conference	2019-2021
IEEE Pacific Visualization Symposium	2020-2021

Invited Journal Review

IEEE Transactions on Visualization and Computer Graphics	2019-2023
Journal of Visualization	2021-2022
IEEE Computer Graphics and Applications	2021-2022
Visual Informatics	2020-2022
Oxford Bioinformatics	2022
IEEE Transactions on Big Data	2020
ACM Transactions on Interactive Intelligent Systems	2020, 2022

PUBLICATIONS

Peer-reviewed Conference and Journal Publications

- [J1] **Qianwen Wang**, Sehi L'Yi, Nils Gehlenborg.
DRAVA: Aligning Human Concepts with ML Latent Dimensions for the Visual Exploration of Small Multiples.
to appear Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI'23)
- [J2] **Qianwen Wang**, Kexin Huang, Payal Chandak, Marinka Zitnik, Nils Gehlenborg.
Extending the Nested Model for User-Centric XAI: A Design Study on GNN-based Drug Repurposing.
IEEE Transactions on Visualization and Computer Graphics 29 (1), 1266-1276 (VIS'22)
Best Paper Honorable Mention at IEEE VIS 2022 🏆
- [J3] Furui Cheng, Mark Keller, Huamin Qu, Nils Gehlenborg, **Qianwen Wang**.
Polyphony: an Interactive Transfer Learning Framework for Single-Cell Data Analysis.
IEEE Transactions on Visualization and Computer Graphics 29 (1), 591-601 (VIS'22)
Best Long Abstract Award at BioVis@ISMB 2022 🏆
- [J4] Aditeya Pandey, Sehi L'Yi, **Qianwen Wang**, Michelle Borkin, Nils Gehlenborg.
GenoREC: A Recommendation System for Interactive Genomics Data Visualization.
IEEE Transactions on Visualization and Computer Graphics 29 (1), 570-580 (VIS'22)

- [J5] Zhihua Jin, Yong Wang, **Qianwen Wang**, Yao Ming, Tengfei Ma, Huamin Qu.
GNNLens: A Visual Analytics Approach for Prediction Error Diagnosis of Graph Neural Networks.
IEEE Transactions on Visualization and Computer Graphics 2022
- [J6] **Qianwen Wang**, Zhutian Chen, Yong Wang, Huamin Qu.
A Survey on ML4VIS: Applying Machine Learning Advances to Data Visualization.
IEEE Transactions on Visualization and Computer Graphics, vol.28, no.12, pp.5134-5153, Dec. 2022
- [J7] Sehi L'Yi, **Qianwen Wang**, Fritz Lekschas, Nils Gehlenborg.
Gosling: A Grammar-based Toolkit for Scalable and Interactive Genomics Data Visualization.
IEEE Transactions on Visualization and Computer Graphics, vol.28, no.1, pp.140-150, Jan. 2022 (VIS'21)
Best Abstract Award at BioVis@ISMB 2021 🏆
- [J8] **Qianwen Wang**, Tali Mazon, Theresa A Harbig, Ethan Cerami, Nils Gehlenborg.
ThreadStates: State-based Visual Analysis of Disease Progression.
IEEE Transactions on Visualization and Computer Graphics, vol.28, no.1, pp.238-247, Jan. 2022 (VIS'21)
- [J9] **Qianwen Wang**, Zhenhua Xu, Zhutian Chen, Yong Wang, Shixia Liu, Huamin Qu.
Visual Analysis of Algorithmic Discrimination.
IEEE Transactions on Visualization and Computer Graphics, vol.27, no.2, pp.1470-1480, Feb. 2021 (VIS'20)
- [J10] Theresa Harbig, Sabrina Nusrat, Tali Mazon, **Qianwen Wang**, Alexander Thomson, Hans Bitter, Ethan Cerami, Nils Gehlenborg. Bioinformatics 37.Supp 1 (2021): i59-i66.
OncoThreads: Visualization of Large Scale Longitudinal Cancer Molecular Data.
- [J11] **Qianwen Wang**, William Alexander, Jack Pegg, Huamin Qu, Min Chen.
HypoML: Visual analysis for hypothesis-based evaluation of machine learning models.
IEEE Transactions on Visualization and Computer Graphics, vol.27, no.2, pp.1417-1426, Feb. 2021 (VIS'20)
- [J12] **Qianwen Wang**, Jun Yuan, Shuxin Chen, Hang Su, Huamin Qu, and Shixia Liu.
Visual Genealogy of Deep Neural Networks.
IEEE Transactions on Visualization and Computer Graphics, vol.26, no.11, pp.3340-3352, Nov. 2020.
- [J13] Chuan Bu, Quanjie Zhang, **Qianwen Wang**, Jian Zhang, Michael Sedlmair, Oliver Deussen, Yunhai Wang.
SineStream: Improving the readability of streamgraphs by minimizing sine illusion effects.
IEEE Transactions on Visualization and Computer Graphics, vol.27, no.2, pp.1634-1643, Feb. 2021 (VIS'20)
- [J14] Zhutian Chen, Wai Tong, **Qianwen Wang**, Benjamin Bach, Huamin Qu.
Augmenting static visualizations with PapARVis designer.
In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI'20).
- [J15] **Qianwen Wang**, Yao Ming, Zhihua Jin, Qiaomu Shen, Dongyu Liu, Micah J. Smith, Kalyan Veeramachaneni, and Huamin Qu. *ATMSeer: Increasing Transparency and Controllability in Automated Machine Learning.*
In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI'19).
- [J16] Zhutian Chen, Yun Wang, **Qianwen Wang**, Yong Wang, Huamin Qu.
Towards automated infographic design: Deep learning-based auto-extraction of extensible timeline.
IEEE Transactions on Visualization and Computer Graphics vol.26, no.1, pp.917-926, Jan 2020 (VIS'19)
- [J17] Yong Wang, Zhihua Jin, **Qianwen Wang**, Weiwei Cui, Tengfei Ma, Huamin Qu.
DeepDrawing: A Deep Learning Approach to Graph Drawing.
IEEE Transactions on Visualization and Computer Graphics, vol.26, no.1, pp.676-686, Jan 2020 (VIS'19)
- [J18] **Qianwen Wang**, Zhen Li, Siwei Fu, Weiwei Cui, Huamin Qu.
Narvis: Authoring narrative slideshows for introducing data visualization designs.
IEEE Transactions on Visualization and Computer Graphics, vol.25, no.1, pp.779-788, Jan. 2019 (VIS'18)

Workshop Papers and Posters

- [W1] **Qianwen Wang**, Nils Gehlenborg.
Interactive Exploration of Tissues and Cells Guided by Visual Pattern Mining
International Conference on Intelligent Systems for Molecular Biology (ISMB 2022)
- [W2] **Qianwen Wang**, Kexin Huang, Payal Chandak, Marinka Zitnik, Nils Gehlenborg.
Interactive Visual Explanations for Deep Drug Repurposing
Interpretable Machine Learning for Healthcare Workshop @ICML 2021 (**Best Paper Award** 🏆)
- [W3] **Qianwen Wang**.
Towards Better Application of Machine Learning Models: A Data Visualization Perspective
VIS 2019 Doctoral Consortium

MEDIA COVERAGE

Nature Technology Feature, A graphics toolkit for visualizing genome data [↗](#)

MIT News, Cracking open the black box of automated machine learning [↗](#)

DeepTech, ATMSeer [↗](#)

INVITED TALKS

Invited Talk, Genetech

Interpreting and Steering AI Explanations with Interactive Visualizations

Jan 2023

Panel on AI+VIS, ChinaVis

Bridge the Capabilities of AI with the Needs of Human Users

Jun 2022

Invited Talk, Zhejiang University Visualization Summer School

Bridge the Capabilities of AI with the Needs of Human Users

Jun 2022

Keynote Presentation, PacificVis 2021 VIS meets AI

From Data to Decisions, a Mixed Path of Data Visualization and Machine Learning

Apr, 2021

Invited Talk, Microsoft Research Asia

Visualization to Guide the Application of Machine Learning

Oct, 2019

Invited Talk, Zhijing Lab, Zhejiang University

Visualization to Guide the Application of Machine Learning

Jul, 2019

Invited Talk, Huawei 2012 Lab

Visualization in the Life Cycle of AI Products

Oct, 2018

TEACHING EXPERIENCE

Course Specialist, Harvard

Data Visualization for Biomedical Applications (BMI 706)

- A graduate-level course with 40-60 students
- Leading the teaching fellows
- Designing the course materials and the programming assignments

2021-2023

Tutorial, Conference on Intelligent Systems for Molecular Biology (ISMB)

Building Interactive Visualizations of Genomics Data with Gosling

- A half-day tutorial with 40-50 participants from diverse backgrounds
- Developing and teaching the tutorial

2022

Lecturer, Harvard HPREP Program

- HPREP is a science enrichment program for high school students from underrepresented backgrounds
- Developing and teaching the curriculum materials

2022-2023

Guest Lecturer, UC Davis

AI + VIS Seminar

- A graduate-level seminar with 20-30 students
- Developing and teaching lectures about the application of ML in data visualization
- Leading the seminar discussion

2022

Teaching Assistant, HKUST

Probability Theory and Stochastic Processes (ELEC2600)

- A undergraduate-level course with more than 50 students
- Designing and grading assignments

2017-2018

Teaching Assistant, HKUST

Signals and Systems (ELEC2700)

- A undergraduate-level course with more than 50 students
- Creating and running coding labs

2016-2017

STUDENT MENTORING

Doctoral Students

Furui Cheng , visiting PhD student at Harvard Interactive Transfer Learning for Single-Cell Data Analysis [J3] Won the Best Abstract Award at BioVis@ISMB	2021-2022
Aditeya Pandey , visiting PhD student at Harvard Recommendation System for Interactive Genomics Data Visualization [J4]	2020-2021
Micah J. Smith , PhD student at MIT Visual Analysis of AutoML [J15]	2018-2019
Zhenhua Xu , PhD student at HKUST Visual Analysis of Algorithmic Discrimination [J9]	2018-2019
Zhihua Jin , PhD student at HKUST Visual Analysis of AutoML and Graph Neural Networks [J5, J15, J17]	2019-2022

Master Students

Katrina Liu , master student at Harvard Medical School Automatic Interpretation and Generation of Genomic Visualizations	2022-now
Man Qing Liang , master student at Harvard Medical School Automatic Interpretation and Generation of Genomic Visualizations	2022-now
Chuan Bu , master student at Shandong University Improving the Readability of Streamgraphs by Minimizing Sine Illusion Effects [J13]	2019-2020

Undergraduate Students

Erica Stutz , undergraduate student at Harvard Summer Intern Program Edge Bundling for Genomic Visualization [deployed online ↗]	2022
Cynthia Rosas , undergraduate student at Harvard Summer Intern Program Theme Library for Gosling Visualization [deployed online ↗]	2021
William Alexander , undergraduate student at Oxford University Hypothesis-based Evaluation of Machine Learning Models [J11]	2019
Jun Yuan , undergraduate student at Tsinghua University Visual Genealogy of Deep Neural Networks [J12]	2018