Qianwen Wang

Data Visualization + Machine Learning

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Education

PhD, Electronic and Computer Engineering — **HKUST**
Supervisor: Prof. Huamin Qu, VIS Lab — *2015 - 2020*

BEng., Electronic Science& Technology — **Xi'an Jiao Tong University**
2011 - 2015

Experience

Havard University — MA, USA
PostDoc Researcher, Department of Biomedical Informatics — *Jul 2020 -*

Oxford University — Oxford, UK
Research Visiting Student — *Aug 2019 - Dec 2019*

HKUST — HongKong, China
Graduate Research Assistant, Explainable AI group — *Oct 2018 - 2019*

Microsoft Research — Beijing, China
Research Intern — *Jun 2017 - Jan 2018*

Research Interest

I am studying **Interactive Data Visual Analytics** within the broad context of Human-Computer Interaction, envisioning interactive visualiation as an effective approach for hypothesis formalization and knowledge communication. My work strives to promote the application of **Machine Learning** in various domains through creating interactive visual analysis systems, with a special interest in solving **biomedical challenges** via **Human-AI collaboration**.

Awards and Funds

Best Paper Honorable Mention, IEEE VIS — *2022*

Postdoctoral Fellows Research Fund, Harvard Data Science Institute — *2022*
Highly Competitive, selected from postdoctoral researchers in Harvard University

Best Long Abstract Award, ISMB BioVis COSI — *2022*
Top 1 out of all submissions

Best Paper Award, IMLH@ICML — *2021*
Top 2 out of 39 accepted papers

Best Abstract Award, ISMB BioVis COSI — *2021*
Top 1 out of all submissions

SENG Academic Award, HKUST — *2019*
From more than 200 PhD students in the School of Engineering

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*

Organizer, Visualization in Biomedical AI Workshop @ IEEE VIS *2022*

Organizer, Tutorial @ ISMB *2022*
Building Interactive Visualizations of Genomics Data with Gosling

Program Committee

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 *2019-2022*

ACM Conference on Intelligent User Interfaces *2020-2021*

ACM Conference on Intelligent User Interfaces *2020-2021*

EuroVis Conference *2019-2020*

ChinaVis Conference *2019-2021*

IEEE Pacific Visualization Symposium *2020-2021*

Invited Journal Review

IEEE Transactions on Visualization and Computer Graphics *2019-2022*

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

J.1 [**TVCG**] **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."
to appear on IEEE Transactions on Visualization and Computer Graphics (VIS'22).
Honorable Mention Award as IEEE VIS 2022

J.2 [**TVCG**] Furui Cheng, Mark Keller, Huamin Qu, Nils Gehlenborg, **Qianwen Wang**.
"Polyphony: an Interactive Transfer Learning Framework for Single-Cell Data Analysis."
to appear on IEEE Transactions on Visualization and Computer Graphics (VIS'22).
Best Long Abstract Award as BioVis@ISMB 2022

J.3 [**TVCG**] Aditeya Pandey, Sehi L'Yi, **Qianwen Wang**, Michelle Borkin, Nils Gehlenborg.
"GenoREC: A Recommendation System for Interactive Genomics Data Visualization."
to appear on IEEE Transactions on Visualization and Computer Graphics (VIS'22).

J.4 [**TVCG**] 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

J.5 [**TVCG**] 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 (VIS'21) Jan; 28(1):140-150.
Best Abstract Award as BioVis@ISMB 2021

J.6 [**TVCG**] **Qianwen Wang**, Tali Mazor, Theresa A Harbig, Ethan Cerami, Nils Gehlenborg.
"ThreadStates: State-based Visual Analysis of Disease Progression."
IEEE Transactions on Visualization and Computer Graphics (VIS'21) 28.1 (2021): 238-247.

J.7 [**TVCG**] **Qianwen Wang**, Zhenhua Xu, Zhutian Chen, Yong Wang, Shixia Liu, Huamin Qu.
"Visual Analysis of Algorithmic Discrimination."
IEEE Transactions on Visualization and Computer Graphics (VIS'20), vol. 27, no. 2, pp. 1470-1480, Feb. 2021

J.8 [**Bioinformatics**] Theresa Harbig, Sabrina Nusrat, Tali Mazor, **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."

J.9 [**TVCG**] **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 (VIS'20), vol. 27, no. 2, pp. 1417-1426, Feb. 2021

J.10 [**TVCG**] **Qianwen Wang**, Zhutian Chen, Yong Wang, Huamin Qu.
"A Survey on ML4VIS: Applying MachineLearning Advances to Data Visualization."
IEEE Transactions on Visualization and Computer Graphics, 2021

J.11 [**TVCG**] **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, 1 Nov. 2020.

J.12 [**TVCG**] 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)

J.13 [**CHI**] 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).

J.14 [**CHI**] **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).

J.15 [**TVCG**] 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)

J.16 [**TVCG**] 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)

J.17 [**TVCG**] **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

W.1 **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)

W.2 **Qianwen Wang**, Sehi L'Yi, Nils Gehlenborg.
"Improving the Utility and Usability of Visualization in AI-driven Scientific Discovery"
DOE ASCR's Workshop on "Data Visualization for Scientific Discovery, Decision Making and Communication"

W.3 **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**)

W.4 **Qianwen Wang**, VIS 2019 Doctoral Consortium.
"Towards Better Application of Machine Learning Models: A Data Visualization Perspective"

Invited Talks

Panel on AI+VIS, ChinaVis — *Jun 2022*
Bridge the Capabilities of AI with the Needs of Human Users

Invited Talk at Zhejing University Visualization Summer School — *Jun 2022*
Bridge the Capabilities of AI with the Needs of Human Users

Invited Talk at UC Davis AI+VIS Seminar — *Feb, 2022*
Applying Machine Learning to Data Visualization: What, Why, When, and How

Keynote Presentation at PacificVis 2021 VIS meets AI — *Apr, 2021*
From Data to Decisions, a Mixed Path of Data Visualization and Machine Learning

Invited Talk at Zhijing Lab — *Jul, 2019*
Visualization to Guide the Application of Machine Learning

Teaching Experience

Course Specialist, Data Visualization for Biomedical Applications — **Harvard**, *2021-2023*
Master-level Class with more than 20 students

Teaching Assistant, Probability Theory and Stochastic Processes — **HKUST**, *2017, 2018*
Undergraduate class with more 50 students

Teaching Assistant, Signals and Systems — **HKUST**, *2016, 2017*
Undergraduate class with more 50 students

Student Mentoring (Selected)

Furui Cheng (visiting PhD student at Harvard) — *2022*
Interactive Transfer Learning Framework for Single-Cell Data Analysis
published at IEEE TVCG, won the Best Abstract Award at BioVis@ISMB

Erica Stutz (undergraduate student at Harvard Summer Intern program) — *2022*
An edge bundling package for Genomic Visualization, deployed online

Aditeya Pandey (visiting PhD student at Harvard) — *2022*
Recommendation System for Interactive Genomics Data Visualization
published at IEEE TVCG

Cynthia Rosas (undergraduate student at Harvard Summer Intern Program) — *2021*
A theme library for Gosling Visualization, deployed online

Chuan Bu (master student at Shandong University) — *2021*
Improving the readability of streamgraphs by minimizing sine illusion effects,
published at IEEE TVCG

Zhihua Jin (PhD student at HKUST) — *2020*
I first mentored Zhihua when he was a undergraduate visiting students from Zhejiang University. He later became a PhD student at HKUST and worked with me for another two projects. All the three projects we worked have been published at IEEE TVCG.

Zhenhua Xu (PhD student at HKUST) — *2019*
Visual Analysis of Algorithmic Discrimination, published at IEEE TVCG

Jun Yuan (Undergraduate student at Tsinghua University) — *2018*
Visual Analysis of Algorithmic Discrimination, published at IEEE TVCG
Jun is currently pursuing a PhD degree at Tsinghua University

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