Qianwen Wang

Data Visualization + Machine Learning

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Education

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

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

Experience

Havard University   MA, USA
PostDoc Researcher, Department of Bioinformatics   *Apr 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**.

Professional Service

Organizing Committee

Poster Chair, IEEE Pacific VIS   *2023*

Abstract Chair, Conference on Intelligent Systems for Molecular Biology   *2022*

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

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

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*

EuroVis Conference	*2019-2020*
ChinaVis Conference	*2019-2021*
IEEE PacificVis Conference	*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*
IEEE Transactions on Big Data	*2020*
ACM Transactions on Interactive Intelligent Systems	*2020, 2022*

Awards

Honorable Mention Award, IEEE VIS	*2022*
Postdoctoral Fellows Research Fund, Harvard Data Science Institute	*2022*
Best Long Abstract Award, ISMB BioVis COSI	*2022*
Best Paper Award, IMLH@ICML	*2021*
Best Abstract Award, ISMB BioVis COSI	*2021*
SENG Academic Award, HKUST	*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*

Publications

Human-AI Collaboration for Bio-Medicine

- [**TVCG**] **Qianwen Wang**, Kexin Huang, Payal Chandak, Nils Gehlenborg, Marinka Zitnik.
  "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).

- [**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).

- [**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.

- [**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).

- [**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.

- [**Bioinformatics**] Theresa Harbig, Sabrina Nusrat, Tali Mazor, **Qianwen Wang**, Alexander Thomson, Hans Bitter, Ethan Cerami, Nils Gehlenborg.
  "OncoThreads: Visualization of Large Scale Longitudinal Cancer Molecular Data."

Bioinformatics 37.Supp 1 (2021): i59-i66.

Visual Analysis of Machine Learning Models

- [**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

- [**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

- [**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.

- [**CHI**] **Qianwen Wang**, Yao Ming, Zhihua Jin, Qiaomu Shen, Dongyu Liu, Micah J. Smith, Kalyan Veeramacha-neni, 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).

- [**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

Intelligent and AI-Powered Visualization

- [**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

- [**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)

- [**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)

- [**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).

- [**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)

- [**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)

Invited Talks

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

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

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

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

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

Teaching Experience

Data Visualization for Biomedical Applications (BMI 760)
Course Specialist, Harvard University   *2021, 2022*

Probability Theory and Stochastic Processes (ELEC 2600)
Teaching Assistant, HKUST   *2017, 2018*

Signals and Systems (ELEC 2100)
Teaching Assistant, HKUST   *2016, 2017*

Student Mentoring

Furui Cheng (visiting PhD student at Harvard)
Interactive Transfer Learning Framework for Single-Cell Data Analysis   *2022*
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)
Recommendation System for Interactive Genomics Data Visualization   *2022*
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)
Improving the readability of streamgraphs by minimizing sine illusion effects,   *2021*
published at IEEE TVCG

Zhihua Jin (PhD student at HKUST)
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   *2020*
projects. All the three projects we worked have been published at IEEE TVCG.

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

Jun Yuan (Undergraduate student at Tsinghua University)
Visual Analysis of Algorithmic Discrimination, published at IEEE TVCG   *2018*
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 🔗

Reference

Nils Gehlenborg (PostDoc advisor)   nils@hms.harvard.edu, Harvard University
Huamin Qu (PhD advisor)   huamin@ust.hk, Hong Kong University of Science and Technology
Marinka Zitnik   marinka@hms.harvard.edu, Harvard University