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 — *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*

ChinaVis — *2019-2021*

EuroVis Conference — *2019-2020*

Invited Journal Review

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

Journal of Visualization *2021-2022*

IEEE Computer Graphics and Applications *2021-2022*

Awards

Postdoctoral Fellows Research Fund Award, 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 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).
- [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 — *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

Data Visualization for Biomedical Applications — *2021, 2022*
Course Specialist, Harvard University

Probability Theory and Stochastic Processes — *2017, 2018*
Teaching Assistant, HKUST

Signals and Systems — *2016, 2017*
Teaching Assistant, HKUST

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)
An edge bundling package for Genomic Visualization, deployed online *2022*

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)
A theme library for Gosling Visualization, deployed online *2021*

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)
Visual Analytics Approach for Prediction Error Diagnosis of Graph Neural Networks, *2020*
published at IEEE TVCG

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

Media Coverage

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