

# Qianwen Wang

Data Visualization + Machine Learning

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## EMPLOYMENT

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**The University of Minnesota, Twin Cities** MN, USA  
**Tenure-Track Assistant Professor**  
Department of Computer Science and Engineering *Aug 2023 - Present*

## EDUCATION

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**Havard University** MA, USA  
**Postdoctoral Research Fellow**, 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

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**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*

## AWARDS AND FUNDS

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**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** *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

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### Organizing Committee

<b>General Chair</b> , International Conference on Intelligent Systems for Molecular Biology	2024
<b>VisNotes (Short Paper) Chair</b> , IEEE Pacific Visualization Symposium	2024
<b>Editor</b> , Visual Informatics	2023-now
<b>Poster Chair</b> , IEEE Pacific Visualization Symposium	2023
<b>Abstract Chair</b> , International Conference on Intelligent Systems for Molecular Biology	2022-2023
<b>Organizer</b> , Visualization in Biomedical AI Workshop @ IEEE VIS	2022
<b>Organizer</b> , Tutorial @ ISMB	2022

### Program Committee

ACM CHI conference on Human Factors in Computing Systems	2024
IEEE VIS Conference	2023
ACM Conference on Intelligent User Interfaces	2023-2024
IEEE Pacific Vis 2022 Visualization Meets AI Workshop	2022
ChinaVis Conference	2022

### Proposal Review

- NSF Panel Reviewer: Information Integration and Informatics (III)
- NSF Panel Reviewer: Human-Centered Computing (HCC)

### 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
IEEE Pacific Visualization Symposium	2020-2021

### Invited Journal Review

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

## PUBLICATIONS

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### 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] Kexin Huang, Payal Chandak, **Qianwen Wang**, Shreyas Havaldar, Akhil Vaid, Jure Leskovec, Girish Nadkarni, Benjamin S. Glicksberg, Nils Gehlenborg, Marinka Zitnik.

*Zero-Shot Prediction of Therapeutic Use with Geometric Deep Learning and Clinician Centered Design.*  
out for review, Nature Medicine, 2023

- [J4] 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** 🏆
- [J5] 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)
- [J6] 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
- [J7] **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
- [J8] Sehi L'Yi, **Qianwen Wang**, Fritz Leuchs, 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** 🏆
- [J9] **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, vol.28, no.1, pp.238-247, Jan. 2022 (VIS'21)
- [J10] **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)
- [J11] 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.*
- [J12] **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)
- [J13] **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.
- [J14] Chuan Bu, Qianjie 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)
- [J15] 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).
- [J16] **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).
- [J17] 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)
- [J18] 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)
- [J19] **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)

## MEDIA COVERAGE

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**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

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<b>Invited Talk, Kavli Frontiers of Science Symposium</b> Bio Data + AI	<i>Jul 2023</i>
<b>Invited Talk, Genetech</b> Interpreting and Steering AI Explanations with Interactive Visualizations	<i>Jan 2023</i>
<b>Panel on AI+VIS, ChinaVis</b> Bridge the Capabilities of AI with the Needs of Human Users	<i>Jun 2022</i>
<b>Invited Talk, Zhejiang University Visualization Summer School</b> Bridge the Capabilities of AI with the Needs of Human Users	<i>Jun 2022</i>
<b>Invited Talk, PacificVis 2021 VIS meets AI</b> From Data to Decisions, a Mixed Path of Data Visualization and Machine Learning	<i>Apr, 2021</i>
<b>Invited Talk, Microsoft Research Asia</b> Visualization to Guide the Application of Machine Learning	<i>Oct, 2019</i>
<b>Invited Talk, Zhijing Lab, Zhejiang University</b> Visualization to Guide the Application of Machine Learning	<i>Jul, 2019</i>
<b>Invited Talk, Huawei 2012 Lab</b> Visualization in the Life Cycle of AI Products	<i>Oct, 2018</i>

## TEACHING EXPERIENCE

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<b>Course Specialist, Harvard</b> Data Visualization for Biomedical Applications (BMI 706) <ul style="list-style-type: none"><li>• A graduate-level course with 40-60 students</li><li>• Leading the teaching fellows</li><li>• Designing the course materials and the programming assignments</li></ul>	<i>2021-2023</i>
<b>Tutorial, Conference on Intelligent Systems for Molecular Biology (ISMB)</b> Building Interactive Visualizations of Genomics Data with Gosling <ul style="list-style-type: none"><li>• A half-day tutorial with 40-50 participants from diverse backgrounds</li><li>• Developing and teaching the tutorial</li></ul>	<i>2022</i>
<b>Lecturer, Harvard HPREP Program</b> <ul style="list-style-type: none"><li>• HPREP is a science enrichment program for high school students from underrepresented backgrounds</li><li>• Developing and teaching the curriculum materials</li></ul>	<i>2022-2023</i>
<b>Guest Lecturer, UC Davis</b> AI + VIS Seminar <ul style="list-style-type: none"><li>• A graduate-level seminar with 20-30 students</li><li>• Developing and teaching lectures about the application of ML in data visualization</li><li>• Leading the seminar discussion</li></ul>	<i>2022</i>
<b>Teaching Assistant, HKUST</b> Probability Theory and Stochastic Processes (ELEC2600) <ul style="list-style-type: none"><li>• A undergraduate-level course with more than 50 students</li><li>• Designing and grading assignments</li></ul>	<i>2017-2018</i>
<b>Teaching Assistant, HKUST</b> Signals and Systems (ELEC2700) <ul style="list-style-type: none"><li>• A undergraduate-level course with more than 50 students</li><li>• Creating and running coding labs</li></ul>	<i>2016-2017</i>

## STUDENT MENTORING

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### Doctoral Students

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

### Master Students

<b>Youfu Yan</b> , master student at UMN	2023-now
<b>Xinyi Liu</b> , master student at UT Austin	2023-2024
<b>Katrina Liu</b> , master student at Harvard Medical School Automatic Interpretation and Generation of Genomic Visualizations	2022-2023
<b>Man Qing Liang</b> , master student at Harvard Medical School Automatic Interpretation and Generation of Genomic Visualizations	2022-2023
<b>Chuan Bu</b> , master student at Shandong University Improving the Readability of Streamgraphs by Minimizing Sine Illusion Effects [J13]	2019-2020

### Undergraduate Students

<b>Hyun Woo Yang</b> , undergraduate student at UMN	2023-now
<b>Erica Stutz</b> , undergraduate student at Harvard Summer Intern Program Edge Bundling for Genomic Visualization [deployed online ↗]	2022
<b>Cynthia Rosas</b> , undergraduate student at Harvard Summer Intern Program Theme Library for Gosling Visualization [deployed online ↗]	2021
<b>William Alexander</b> , undergraduate student at Oxford University Hypothesis-based Evaluation of Machine Learning Models [J11]	2019
<b>Jun Yuan</b> , undergraduate student at Tsinghua University) Visual Genealogy of Deep Neural Networks [J12]	2018