Dongyu Liu

Department of Computer Science University of California-Davis 2123 Kemper Hall Davis, CA 95616

PROFESSIONAL EXPERIENCE

	Assistant Professor, UC Davis Department of Computer Science, College of Engineering
•	Postdoctoral Associate, MIT Data-to-Al group, with Kalyan Veeramachaneni
•	Research Assistant, Hong Kong University of Science and Technology <i>VISLab, with Huamin Qu</i>
Nov 2018 -	Research Assistant, MIT

Apr 2018 Human-Machine Intelligence Group, with PanPan Xu and Liu Ren Jul 2016 - Research Intern, Microsoft Research Asia

Apr 2017 Internet Graphics Group, with Weiwei Cui Summer Research Intern, Tencent

Sep 2017 - Research Intern, Bosch Research

2016 WeChat Technical Architecture Group2012—16 Research Assistant, Zhejiang University

Visiting Graduate (15-16), Interactive Data Group, with Yingcai Wu Undergraduate (12-14), State Key Lab of CAD&CG, with Hongxin Zhang Undergraduate (12-14), EAGLE Lab, with Jiajun Bu

EDUCATION

2014-19 Ph.D. in Computer Science & Engineering

Hong Kong University of Science and Technology, Hong Kong

Thesis: Combining Automated Analysis with Interactive Vis for Spatio-temporal Data Analysis

Advisor: Huamin Qu

Committee: Pedro Sander, Yangqiu Song, Zhongming Lu, Claudio Silva

2010—14 B.Eng. in Computer Science and Technology

Zhejiang University, Hangzhou, China

Thesis: The Design and Implementation of an Intelligent and Emotional Chatbot

Advisor: Jiajun Bu

Tompleted the Chu Kochen Honors Program

HONORS & AWARDS

- Finalist of the HKUST SENG PhD Research Excellence Award
 Only 3 from more than 200 PhD graduates in the School of Engineering 2019-20.
- 2018 IEEE VIS (VAST) Best Paper Award
- 2014-18 Hong Kong PhD Fellowship Scheme (≈120,000 USD)

A highly prestigious and competitive fellowship established by the Hong Kong RGC.

- 2018 Overseas Research Award (≈6,000 USD)
- 2017 Stars of Tomorrow (Award of Excellent Intern), Microsoft Research Asia
- 2017 Excellent Oral Presentation Award in ZJU International Doctoral Students Conference.
- 2015 Honorable Mention Award at IEEE VAST Grand Challenge
- 2015 Merit Award in E-Learning at The Asia Pacific ICT Alliance (APICTA)
- 2014 Zhejiang University Outstanding Dissertation Award
- 2013 Awardee of Zhejiang Provincial College Students' Science and Technology Innovation Program
- 2013 Honorable Mention Award in COMAP's Mathematical Contest in Modeling
- 2012 Honorable Mention Award in CSIAM's Undergraduate Mathematical Contest in Modeling
- 2012 Awardee of National Undergraduate Training Program for Innovation and Entrepreneurship
- 2009 First Prize in National Olympiad in Informatics in Provinces

 Top 1 out of ~5k participants in Fujian Province and top 5 out of ~80k participants in China.

RESEARCH FUNDING

2026 CRTRIS Seed Award. Pls: Dongyu Liu and Lihong Mo, \$60k

Point-of-care Cardiovascular Assessment for Earlier Detection of Preeclampsia and Heart Failure in at-risk Pregnant Patients

2025 Bosch Research Award. Pl: Dongyu Liu, \$75k

UI Understanding and Adaptive Learning with Multimodal LLMs

2024-27 **NSF III:Small**, #2427770. PI: Kwan-Liu Ma, co-PI: Dongyu Liu, \$600k

Communicating and Resolving Ambiguity in Collaborative Visual Analytics

2024 Bosch Gift. PI: Dongyu Liu, \$55k

GenAl Native UIs for Advanced Data Analytics

PUBLICATIONS

JOURNAL PAPERS

2025 [J1] ClimateSOM: A Visual Analysis Workflow for Climate Ensemble Datasets

Yuya Kawakami, Daniel Cayan, Dongyu Liu, Kwan-Liu Ma

TVCG IEEE Transactions on Visualization and Computer Graphics (in press).

[J2] Save It for the "Hot" Day: An LLM-Empowered Visual Analytics System for Heat Risk Management

Haobo Li, Wong Kam-Kwai, Yan Luo, Juntong Chen, Chengzhong Liu, Yaxuan Zhang, Alexis Kai Hon Lau, Huamin Qu, **Dongyu Liu**

TVCG IEEE Transactions on Visualization and Computer Graphics.

^{*} indicates equal contribution.

[J3] InterChat: Enhancing Generative Visual Analytics using Multimodal Interactions

Juntong Chen, Jiang Wu, Jiajing Guo, Vikram Mohanty, Xueming Li, Jorge Piazentin Ono, Wenbin He, Liu Ren, **Dongyu** Liu

CGF Computer Graphics Forum (in press).

> Special Issue: Proceedings of EuroVis 2025.

InclusiViz: Visual Analytics of Human Mobility Data for Understanding and Mitigating Urban Segregation

Yue Yu, Yifang Wang, Yongjun Zhang, Huamin Qu, Dongyu Liu

TVCG IEEE Transactions on Visualization and Computer Graphics (in press).

> Special Issue: Proceedings of IEEE PacificVis 2025 (TVCG track).

2024 [J5] Towards Dataset-scale and Feature-oriented Evaluation of Text Summarization in Large Language Model Prompts

Sam Yu-Te Lee, Aryaman Bahukhandi, Dongyu Liu, Kwan-Liu Ma

TVCG IEEE Transactions on Visualization and Computer Graphics (in press).

> Special Issue: Proceedings of IEEE VIS 2024.

[J6] SpreadLine: Visualizing Egocentric Dynamic Influence

Yun-Hsin Kuo, Dongyu Liu, Kwan-Liu Ma

TVCG IEEE Transactions on Visualization and Computer Graphics (in press).

> Special Issue: Proceedings of IEEE VIS 2024.

2022 [J7] RASIPAM: Interactive Pattern Mining of Multivariate Event Sequences in Racket Sports

Jiang Wu, Dongyu Liu, Ziyang Guo, Yingcai Wu

TVCG IEEE Transactions on Visualization and Computer Graphics.

> Special Issue: Proceedings of IEEE VIS 2022.

[J8] The Need for Interpretable Features: Motivation and Taxonomy

Alexandra Zytek, Ignacio Arnaldo, **Dongyu Liu**, Laure Berti-Equille, Kalyan Veeramachaneni SIGKDD ACM SIGKDD Explorations Newsletter, 2022.

[J9] MTV: Visual Analytics for Detecting, Investigating, and Annotating Anomalies in Multivariate Time Series

Dongyu Liu, Sarah Alnegheimish, Alexandra Zytek, and Kalyan Veeramachaneni

PACMHCI Proceedings of the ACM on Human-Computer Interaction, 2022.

> Special Issue: Proceedings of ACM CSCW 2022.

2021 [J10] VBridge: Connecting the Dots Between Features and Data to Explain Healthcare Models

Furui Cheng, **Dongyu Liu**, Fan Du, Yanna Lin, Alexandra Zytek, Haomin Li, Huamin Qu, Kalyan Veeramachaneni

TVCG IEEE Transactions on Visualization and Computer Graphics, 2022.

> Special Issue: Proceedings of IEEE VIS 2021.

Paper Honorable Mention (top 5%)

[J11] Sibyl: Understanding and Addressing the Usability Challenges of Machine Learning In High-Stakes Decision Making

Alexandra Zytek, **Dongyu Liu**, Rhema Vaithianathan, Kalyan Veeramachaneni

TVCG IEEE Transactions on Visualization and Computer Graphics, 2022.

> Special Issue: Proceedings of IEEE VIS 2021.

[J12] TacticFlow: Visual Analytics of Ever-Changing Tactics in Racket Sports

Jiang Wu, Dongyu Liu, Ziyang Guo, Qingyang Xu, Yingcai Wu

TVCG IEEE Transactions on Visualization and Computer Graphics, 2022.

> Special Issue: Proceedings of IEEE VIS 2021.

[J13] MIG-Viewer: Visual Analytics of Soccer Player Migration

Anqi Cao, Xiao Xie, Ji Lan, Huihua Lu, Xinli Hou, Jiachen Wang, Hui Zhang, Dongyu Liu, Yingcai Wu

VI Visual Informatics, 2021.

2018 [J14] TPFlow: Progressive Partition and Multidimensional Pattern Extraction for Large-Scale Spatio-Temporal Data Analysis

Dongyu Liu, Panpan Xu, Liu Ren

TVCG IEEE Transactions on Visualization and Computer Graphics, 2019.

> Special Issue: Proceedings of IEEE VIS 2018 - VAST Track.

P Best Paper Award (Top 1)

[J15] DeepTracker: Visualizing the Training Process of Convolutional Neural Networks

Dongyu Liu, Weiwei Cui, Kai Jin, Yuxiao Guo, Huamin Qu

TIST ACM Transactions on Intelligent Systems and Technology, 2018.

2016 [J16] SmartAdP: Visual Analytics of Large-scale Taxi Trajectories for Selecting Billboard Locations

Dongyu Liu, Di Weng, Yuhong Li, Jie Bao, Yu Zheng, Huamin Qu, Yingcai Wu

TVCG IEEE Transactions on Visualization and Computer Graphics, 2017.

> Special Issue: Proceedings of IEEE VIS 2016 - VAST Track.

The top 20 most cited work in TVCG since 2017

[J17] egoComp: A Node-link Based Technique for Visual Comparison of Ego-network

Dongyu Liu, Fangzhou Guo, Bowen Deng, Huamin Qu, Yingcai Wu

Iv Information Visualization, SAGE, 2016.

2015 [J18] PeakVizor: Visual Analytics of Peaks in Video Clickstreams from Massive Open Online Courses

Qing Chen, Yuanzhe Chen, Dongyu Liu, Huamin Qu, Conglei Shi, Yingcai Wu

TVCG IEEE Transactions on Visualization and Computer Graphics, 2016.

REFERRED CONFERENCE PROCEEDINGS

2025 [C1] Non-programmers Assessing Al-Generated Code: A Case Study of Business Users Analyzing Data Yuvraj Virk, Dongyu Liu

VL/HCC IEEE Symposium on Visual Languages and Human-Centric Computing (Short Paper).

2022 [C2] AER: Auto-Encoder with Regression for Time Series Anomaly Detection

Lawrence Wong, **Dongyu Liu**, Laure Berti-Equille, Sarah Alnegheimish, Kalyan Veeramachaneni BigData IEEE International Conference on Big Data, 2022.

[C3] Sintel: A Machine Learning Framework to Extract Insights from Signals

Sarah Alnegheimish, Dongyu Liu, Carles Sala, Laure Berti-Équille, Kalyan Veeramachaneni

SIGMOD ACM SIGMOD/PODS International Conference on Management of Data, 2022.

Popular open source library (github stars > 850)

2020 [C4] TadGAN: Time Series Anomaly Detection Using Generative Adversarial Networks

Dongyu Liu*, Alexander Geiger*, Sarah Alnegheimish, Alfredo Cuesta-Infante, Kalyan Veeramachaneni

BigData IEEE International Conference on Big Data, 2020.

[C5] Cardea: An Open Automated Machine Learning Framework for Electronic Health Records

Sarah Alnegheimish, Najat Alrashed, Faisal Aleissa, Shahad Althobaiti, **Dongyu Liu**, Mansour Alsaleh, and Kalyan Veeramachaneni

DSAA IEEE International Conference on Data Science and Advanced Analytics, 2020.

2018 [C6] ATMSeer: Increasing Transparency and Controllability in Automated Machine Learning

Qianwen Wang, Yao Ming, Zhihua Jin, Qiaomu Shen, **Dongyu Liu**, Micah J. Smith, Kalyan Veeramachaneni, Huamin Qu CHI ACM Conference on Human Factors in Computing Systems, 2019.

2016 [C7] A Guided Tour of Literature Review: Facilitating Academic Paper Reading with Narrative Visualization

Yun Wang, **Dongyu Liu**, Huamin Qu, Qiong Luo, Xiaojuan Ma

VINCI ACM International Symposium on Visual Information Communication and Interaction, 2016.

PREPRINTS

2025 [P1] VIDEE: Visual and Interactive Decomposition, Execution, and Evaluation of Text Analytics with Intelligent Agents

Sam Yu-Te Lee, Chengyang Ji, Shicheng Wen, Lifu Huang, **Dongyu Liu**, Kwan-Liu Ma arXiv preprint, 2025.

2024 [P2] CATP: Context-Aware Trajectory Prediction with Competition Symbiosis

Jiang Wu, **Dongyu Liu**, Yuchen Lin, Yingcai Wu

arXiv preprint, 2024.

2023 [P3] Pyreal: A Framework for Interpretable ML Explanations

Alexandra Zytek, Wei-En Wang, **Dongyu Liu**, Laure Berti-Equille, Kalyan Veeramachaneni arXiv preprint, 2023.

2021 [P4] AQEyes: Visual Analytics for Anomaly Detection and Examination of Air Quality Data

Dongyu Liu, Kalyan Veeramachaneni, Alexander Geiger, Victor O.K. Li, Huamin Qu arXiv preprint, 2021.

REFERRED WORKSHOP PAPERS, EXTENDED ABSTRACT, AND POSTERS

2023 [O1] Beep: Balancing Effectiveness and Efficiency when Finding Multivariate Patterns in Racket Sports
Jiang Wu, Dongyu Liu, Ziyang Guo, Yingcai Wu

KDD 2023 Workshop on Data Science and Al for Sports (DSAI4Sports).

2021 [O2] Sibyl: Explaining Machine Learning Models for Better Child Welfare Decision Making

Alexandra Zytek, **Dongyu Liu**, Rhema Vaithianathan, and Kalyan Veeramachaneni

CHI ACM Conference on Human Factors in Computing Systems - Extended Abstracts, 2021.

2020 [O3] Understanding User-Bot Interactions for Small-Scale Automation in Open-Source Development

Dongyu Liu*, Micah J. Smith*, and Kalyan Veeramachaneni

CHI ACM Conference on Human Factors in Computing Systems - Extended Abstracts, 2020.

2015 [04] egoComp: A Node-link Based Technique for Visual Comparison of Ego-network

Dongyu Liu, Fangzhou Guo, Bowen Deng, Huamin Qu, Yingcai Wu

vis IEEE Visualization Conference - Exploring Graphs at Scale Workshop, 2015.

[05] ParkVis: Visual Analytic System for Population Movement in DinoFun World

Abishek Puri, **Dongyu Liu**, Shaoyu Chen, Siwei Fu, Tianyu Wang, Yeukyin Chan, Huamin Qu

vis IEEE Visualization Conference - VAST Challenge, 2015

2013 [O6] InSide: Interactive Sketching for Image Database Exploration

Hongxin Zhang, Dongyu Liu, Changhan Wang

CAD/Graphics IEEE International Conference on Computer-Aided Design and Computer Graphics, 2013.

PATENTS

2022 Interpretable Visualization System for Graph Neural Network

Dakuo Wang, Sijia Liu, Abel Valente, Chuang Gan, Bei Chen, **Dongyu Liu**, Yi Sun U.S. Patent Publication US20220101120A1, published on March 31, 2022.

2020 System and Method for Large Scale Multidimensional Spatio-Temporal Data Analysis

Panpan Xu, Liu Ren, Dongyu Liu

U.S. Patent 10846321, issued on November 24, 2020.

INVITED TALKS

	Making Sense of Air Pollution Data to Inform Decisions in Underserved Communities
Jul 2024	ChinaVis at Hong Kong, Panel of Visualization Aids Sustainable Development
	Charting the Unseen: Visualization as the Pathway to Effective Human-Al Teaming
Jul 2024	Zhejiang University, Summer School
Apr 2024	UC Berkeley, 15th annual California Cognitive Science Conference (CCSC)
	Signal Intelligence: Human-Al Teaming for Time Series Analytics
Oct 2023	UC Davis, MADDD Seminars (Mathematics of Data and Decisions at Davis)
Oct 2023	UC Davis, Seminars in the Center for Spaceflight Research
Jul 2023	ChinaVis, Special Topic on VIS + AI
	Make the Invisible Visible: Human-Al Teaming in Healthcare Data Analytics ይ
Oct 2023	UC Davis, ECS289H - Special Topics in Human-Al Interactions
Jul 2023	UC Davis, Interventional Biophotonics Week Symposium and Summer School
	Human-Al Teaming for Decision-Making: Augmenting Human Intellect with Visualization and Human-Centered Al
Jul 2023	Zhejiang University, Summer School
Mar 2023	UC Davis
Mar 2023	ETH Zürich
Mar 2023	Florida State University
Mar 2023	Purdue University
Jan 2023	Hong Kong University of Science and Technology
Dec 2022	Peking University
	Sintel: An Overarching Ecosystem for End-to-End Time Series Anomaly Detection
Jan 2022	Shangdong University, Interactive Data Exploration System (IDEAS) lab
Nov 2021	Hong Kong University of Science and Technology, VisLab
Jul 2021	Zhejiang University, Summer School
Jan 2021	Schlumberger
	Combining Automated Analysis with Interactive Vis for Spatio-temporal Data Analysis 📙
Oct 2019	MIT, Data to Al Group
Aug 2018	Hong Kong University of Science and Technology, PhD Thesis Defense
May 2019	Hong Kong University of Science and Technology, RPG Student Forum & Tea Gathering
	What Visualization Can Do for Explainable Als
Nov 2017	Bosch Research, Al Workshop
	Things You Need to Know about Ph.D. Study
May 2017	Zhejiang University 120th Anniversary
	Use Big Urban Data for Citywide Optimal Location Selection
Apr 2016	Zhejiang University, Workshop on Urban Computing
	Learn to be a Good Full-Stack Developer as a Visualization Researcher
Jan 2016	Zhejiang University, State Key Lab of CAD&CG
	Visual Analytics for Student Online Learning Behavior Analysis
Nov 2015	Microsoft Research Asia Symposium on Collaborative Research

TEACHING

2025 — ECS273 - Visual Analytics

UC Davis

[S25] Instructor.

2024 - ECS163 - Information Interfaces

UC Davis

[W24, S25] Instructor.

2024 ECS289G - Human-Al Teaming

UC Davis

[S24] Instructor.

2023 ECS272 - Information Visualization

UC Davis

[F23] Guest Instructor with Prof. Kwan-Liu Ma.

2021 Kaufman Teaching Certificate Program (KTCP)

MIT

As a Trainee, I completed 8 training workshops and 2 teaching demos (Certificate).

ADVISING AND MENTORING

ADVISEES

PhD Jianxing Zhao (CS)

Madhumitha Venkatesan (CS)

Yueqiao Chen (CS)

Yu-Chia Huang (CS; Co-advised with Kwan-Liu Ma)

Master's Guoruizhe Sun (CS)

Himanshu Nimonkar (CS)

Emily Guo (CS'25; Now at PG&E)

UG Xuyang Chen (Physics)

Yuvraj Virk (CS)

Boquan Fang (CS'24; Now at Amazon AWS)

Yinkun Tang (CS'24; Now PhD at UIUC)

Visiting Yuhan Huang (AI UG from Wuhan University)

Ke Yao (CS UG from Wuhan University)

Patrick Yao (CS UG from Hong Kong Univ)

Juntong Chen (CS MS from East China Normal Univ; Now at Nvidia)

Jiang Wu (CS PhD from Zhejiang Univ; Now at Hithink RoyalFlush)

Committee Rong-Ching Chang (CS, PhD QE, as chair)

Mak Ahmad (CS, PhD QE & Thesis)

Sam Yu-Te Lee (CS, PhD QE & Thesis)

Hsiao-Ying Lu (CS, PhD QE & Thesis)

Jingchao Fang (CS'24, PhD Thesis; Now postdoc at UChicago)

Capstone Catherine Kang, Jacob Vogt, Hangyul Yun, Mihika Krishna (CS'24)

Jose Gavidia, Billy Ouattara, Seungeui Song, Roger Cheng (CS'24)

MENTEES PRIOR TO UC DAVIS

PhD Rui Sheng (HKUST CSE)

Alexandera Zytek (MIT EECS'24; Now Postdoc Fellow at Sierra AI)

Sara Pidò (PoliMi DADS'23; Now Postdoc at MIT)

Furui Cheng (HKUST CSE'22; Now Postdoc at ETH Zürich)

Yifang Wang (HKUST CSE'22; Now Postdoc at Northwestern)

Master's Sarah Alnegheimish (MIT EECS'22; Now PhD at MIT)

Romain Palazzo (EPFL CS/MATH'22; Now at DataCebo)

Lawrence Wong (MIT EECS'22; Now at Amazon)

Nassim Oufattole (MIT EECS'22; Now PhD at MIT)

Alexander Geiger (TUM IS'20; Now at MontBlancAI)

UG Rui Yao (MIT EECS'22; Now Master's at MIT)

Saarang Bondalapati (High School Intern; Now UG at Cornell)

Bowen Deng (HKUST CSE'17; Now at Pinterest)

Abishek Puri (HKUST CSE'16; Now at J.P. Morgan)

SERVICE AND OUTREACH

PAPER REVIEWING

Conf. IEEE VIS 2015—25, IEEE PacificVis 2016—24, EuroVis 2016—24, ChinaVis 2018—23,

ACM CHI 2020—24, ACM CSCW 2022—23, ACM IUI 2019, IEEE DSAA 2022—23

Journal IEEE TVCG 2016—25, IEEE CG&A 2021, ACM TiiS 2019/23, ACM IJHCI 2021,

TMLR 2022—24, VLDB Journal 2021, JVLC 2018,

IEEE TBD 2021, IEEE TNSE 2021, IEEE Access 2020

EDITORIAL BOARDS

2023 — Associate Editor, Young Advisory Board, Journal of Visual Informatics

CONFERENCE COMMITTEES

- 2023—25 Member, Program Committee, IEEE VIS
 - 2025 Member, Program Committee, VisMeetsAl workshop at IEEE PacificVis 2025
 - 2024/26 Posters Co-Chair, Organizing Committee, IEEE PacificVis
- 2022-23 Member, Program Committee, IEEE DSAA
- 2022-23 Member, Program Committee, ChinaVis
- 2020-22 Member, Program Committee, IEEE VIS (short paper)

COMMUNITY SERVICE

- 2024 Reviewer, NSF Proposal Review Panel.
- 2024 Member, Recruitment Advisory Committee, UC Davis.
- 2024 Member, GGCS Admissions Committee, UC Davis.
- 2022 **Mentor**, SES Graduate Application Assistance Program, MIT IDSS

Assisted students from underrepresented groups in preparing PhD applications.

2021 Peer Reviewer, Mock Faculty Job Talk, MIT LIDS

- 2020 **Program Committee**, C3.ai Digital Transformation Institute Research Award

 The awards are created to address Mitigation of COVID-19 and Future Pandemics.
- 2018—19 Weekly Seminar Coordinator (>30 participants), HKUST VisLab
 - 2018 Student Volunteer, IEEE VIS 2018

MEDIA COVERAGE

- Feb 2025 Visualizing and Communicating Ambiguity for High-Stakes Collaboration

 UC Davis COE News, by Jessica Heath

 Aug 2023 Cultivating Collaboration: Dr. Dongyu Liu Connects People to Al and with Each Other

 UC Davis COE News, by Jessica Heath

 Jun 2022 Building Explainability into the Components of Machine Learning Models

 MIT News, by Adam Zewe (reproduced by ScienceDaily and Dataconomy)

 Oct 2021 Making Machine Learning More Useful to High-Stakes Decision Makers

 MIT News, by Adam Zewe (featured on the front page)

 Apr 2021 One-Stop Machine Learning Platform Turns Health Care Data Into Insights

 MIT News, by MIT LIDS (reproduced by Health IT Analytics)

 Dec 2020 Method Finds Hidden Warning Signals in Measurements Collected Over Time

 MIT News, by Daniel Ackerman (reproduced by Datanami)

 May 2019 Cracking Open the Black Box of Automated Machine Learning

 MIT News, by Rob Matheson (reproduced by InfoQ)
- Jun 2017 From Taxi Trajectories to Outdoor Billboard Location Selection (Chinese)
 Top Al News, by Microsoft Research Asia