

Dongyu Liu

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PROFESSIONAL EXPERIENCE

- Jul 2023 - **Assistant Professor**, UC Davis
Present *Department of Computer Science, College of Engineering*
- Sep 2019 - **Postdoctoral Associate**, MIT
Mar 2023 *Data-to-AI group, with Kalyan Veeramachaneni*
- Aug 2014 - **Research Assistant**, Hong Kong University of Science and Technology
Aug 2019 *VISLab, with Huamin Qu*
- Nov 2018 - **Research Assistant**, MIT
Apr 2019 *Data-to-AI group, with Kalyan Veeramachaneni*
- Sep 2017 - **Research Intern**, Bosch Research
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 2016 **Research Intern**, Tencent
WeChat Technical Architecture Group
- 2012—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
Advisor: Huamin Qu
Thesis: Combining Automated Analysis with Interactive Vis for Spatio-temporal Data Analysis
Committee: Pedro Sander, Yangqiu Song, Zhongming Lu, Claudio Silva
- 2010—14 **B.Eng. in Computer Science and Technology**
Zhejiang University, Hangzhou, China
Advisor: Jiajun Bu, Hongxin Zhang
Thesis: The Design and Implementation of an Intelligent and Emotional Chatbot
 Graduated under the Chu Kochen Honors Program

HONORS & AWARDS

- 2021 IEEE VIS Best Paper Honorable Mention Award
- 2020 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 (\approx 120,000 USD)
A highly prestigious and competitive fellowship established by the Hong Kong RGC.
- 2018 Overseas Research Award (\approx 6,000 USD)
- 2017 Award of Excellence in Microsoft Research Asia Stars of Tomorrow Internship Program
- 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 Honorable Mention Award for U.S. COMAP's Mathematical Contest in Modeling
- 2012 Co-PI of National Undergraduate Training Program for Innovation and Entrepreneurship (¥30,000)
- 2012 PI of Zhejiang Provincial College Students' Science and Technology Innovation Program (¥10,000)
- 2009 First Prize in National Olympiad in Informatics in Provinces
Top 1 out of \sim 5k participants in Fujian Province and top 5 out of \sim 80k participants in China.

GRANTS

- 2024—25 GenAI Native UIs for Advanced Data Analytics.
PI, \$55,000, from Robert Bosch LLC

PUBLICATIONS







* indicates equal contribution.

PEER-REVIEWED CONFERENCE AND JOURNAL PUBLICATIONS



- 2022 [P1] **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. (to appear)
- [P2] **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.*
- [P3] **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.

- [P4] **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 \(github stars > 850\)](#)
- [P5] **MTV: Visual Analytics for Detecting, Investigating, and Annotating Anomalies in Multivariate Time Series**
Dongyu Liu, Sarah Alnegheimish, Alexandra ZYTEK, and Kalyan Veeramachaneni
PACM Proceedings of the ACM on Human-Computer Interaction, 2022.
> *Special Issue: Proceedings of ACM CSCW 2022.*
- 2021 [P6] **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.*
 [Best Paper Honorable Mention \(top 5%\)](#)
- [P7] **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.*
- [P8] **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.*
- [P9] **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.
- 2020 [P10] **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.
- [P11] **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 [P12] **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.
- [P13] **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.*





 [Best Paper Award \(Top 1\)](#)

- [P14] **DeepTracker: Visualizing the Training Process of Convolutional Neural Networks**
Dongyu Liu, Weiwei Cui, Kai Jin, Yuxiao Guo, Huamin Qu
 ACM Transactions on Intelligent Systems and Technology, 2018.
- 2016 [P15] **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
 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](#)
- [P16] **A Guided Tour of Literature Review: Facilitating Academic Paper Reading with Narrative Visualization**
Yun Wang, **Dongyu Liu**, Huamin Qu, Qiong Luo, Xiaojuan Ma
 ACM International Symposium on Visual Information Communication and Interaction, 2016.
- [P17] **egoComp: A Node-link Based Technique for Visual Comparison of Ego-network**
Dongyu Liu, Fangzhou Guo, Bowen Deng, Huamin Qu, Yingcai Wu
 Information Visualization, SAGE, 2016.
- 2015 [P18] **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
 IEEE Transactions on Visualization and Computer Graphics, 2016.

PREPRINTS

- 2023 [T1] **Pyreal: A Framework for Interpretable ML Explanations**
Alexandra Zytek, Wei-En Wang, **Dongyu Liu**, Laure Berti-Equille, Kalyan Veeramachaneni
 arXiv preprint, 2023.
- 2021 [T2] **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.

WORKSHOP PAPERS, EXTENDED ABSTRACT, AND POSTERS

- 2023 [W1] **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 AI for Sports (DSAI4Sports).
- 2021 [W2] **Sibyl: Explaining Machine Learning Models for Better Child Welfare Decision Making**
Alexandra Zytek, **Dongyu Liu**, Rhema Vaithianathan, and Kalyan Veeramachaneni
 ACM Conference on Human Factors in Computing Systems - Extended Abstracts, 2021.
- 2020 [W3] **Understanding User-Bot Interactions for Small-Scale Automation in Open-Source Development**
Dongyu Liu*, Micah J. Smith*, and Kalyan Veeramachaneni
 ACM Conference on Human Factors in Computing Systems - Extended Abstracts, 2020.
- 2015 [W4] **egoComp: A Node-link Based Technique for Visual Comparison of Ego-network**
Dongyu Liu, Fangzhou Guo, Bowen Deng, Huamin Qu, Yingcai Wu
 IEEE Visualization Conference - Exploring Graphs at Scale Workshop, 2015.

[W5] **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 [W6] **InSide: Interactive Sketching for Image Database Exploration**
Hongxin Zhang, **Dongyu Liu**, Changan 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 Application 17/039,989, filed March 31, 2022.

2020 **System and Method for Large Scale Multidimensional Spatio-Temporal Data Analysis**
Panpan Xu, Liu Ren, **Dongyu Liu**
U.S. Patent 10,846,321, issued November 24, 2020.

INVITED TALKS

Charting the Unseen: Visualization as the Pathway to Effective Human-AI Teaming

Apr 2024 UC Berkeley, 15th annual California Cognitive Science Conference (CCSC)

Signal Intelligence: Human-AI 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-AI Teaming in Healthcare Data Analytics

Oct 2023 UC Davis, Special Topics in Human-AI Interactions

Jul 2023 UC Davis, Interventional Biophotonics Week Symposium and Summer School

Human-AI Teaming for Decision-Making: Augmenting Human Intellect with Visualization and Human-Centered AI

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 AI 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 AIs

Nov 2017 Bosch Research, AI 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

Nov 2015 Workshop of WeChat-HKUST Joint Lab on AI Technology (WHAT LAB)

TEACHING

- 2024— **ECS289G - Human-AI Teaming** *UC Davis*
[S24] Instructor.
- 2024— **ECS163 - Information Interfaces** *UC Davis*
[W24] Instructor.
- 2023— **ECS272 - Information Visualization** *UC Davis*
[F23] Guest Instructor invited by Prof. Kwan-Liu Ma.
- 2023 **ECS289H - Special Topics in Human-AI Interactions** *UC Davis*
Guest Lecturer invited by Prof. Hao-Chuan Wang.
- 2021/23 **International Summer School on Visual Analytics** *Zhejiang University*
Guest Lecturer.
- 2021 **Kaufman Teaching Certificate Program (KTCP)** *MIT*
As a Trainee, I completed 8 training workshops and 2 teaching demos (see [Vice Chancellor Letter](#)).
- 2018 **MSBD5005 - Data Visualization** *Hong Kong University of Science and Technology*
Graduate Teaching Assistant for Prof. Huamin Qu.
- 2009 **Introduction to C++ Programming** *Fuzhou No.1 Middle School*
High School Student Teaching Assistant for Ms. Ying Chen.

ADVISING AND MENTORING

ADVISEES

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

Yueqiao Chen (CS)

Jiang Wu (Visiting PhD from Zhejiang Univ.)

Master's **Emily Guo** (CS)

UG **Boquan Fang** (CS)

Yinkun Tang (CS)

Thesis
Committee **Jingchao Fang** (CS)

UG **Catherine Kang, Jacob Vogt, Hangyul Yun, Mihika Krishna** (24'WS)

Capstone **Jose Gavidia, Billy Ouattara, Seungeui Song, Roger Cheng** (24'WS)

MENTEES PRIOR TO UC DAVIS

PhD **Alexandera Zyttek** (MIT EECS)

Rui Sheng (HKUST CSE)

Sara Pidò (PoliMi DADS'23; Now at Calvin Risk)

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)

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

Sarang 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 2015–24, 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, IEEE ICPADS 2018, ISVC 2018

Journal IEEE TVCG 2016–24, IEEE CG&A 2021, ACM TiiS 2019/23, ACM IJHCI 2021, TMLR 2022, 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

2024 **Posters Co-Chair**, Organizing Committee, IEEE PacificVis

2023—24 **Member**, Program Committee, IEEE VIS

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 **Member**, GGCS MS Admission 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

Aug 2023 Cultivating Collaboration: Dr. Dongyu Liu Connects People to AI 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 AI News](#), by Microsoft Research Asia