Ke Xu

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Education

Sept 2015 - Aug 2019 **Ph.D. in Electronic and Computer Engineering**
Hong Kong University of Science and Technology, Hong Kong, China

- Supervisor: Prof. Huamin Qu
- Thesis: Visual Anomaly Detection and Its Applications.

Sept 2011 - Jul 2015 **B.S. in Electronic Science and Technology**
Nanjing University, Nanjing, China

- Ranking: 1/217.
- Thesis: FPGA-based Design of FFT & FIR.

Research Interests

Data Intelligence, Visual Analytics, Business Intelligence (BI) , LLM+AI+BI, Anomaly Detection, Explainable AI, Time-series Analytics, Healthcare

Research / Work Experience

Jan 2021 - present **Huawei Cloud,** Hangzhou, China
Head of Visual Analytics Center, Asst. Chief Data Scientist, Data Intelligence Innovation Lab

- Hired by Huawei "**Top Young Talents**" scheme.
- Lead the incubation of **DataArts Insight**, **Huawei's first business intelligence (BI)** cloud service, and work with **Pangu** Model to conduct POC at ICBC, Didi, etc, improve Huawei data analysis efficiency by 10+ times, with an estimated sales target of 100 million in 2024.
- Lead the creation of **Achart**, Huawei Cloud's **first chart library brand**, with 4,000+ downloads in half a year
- Developed 10+ intelligent analysis capabilities such as BI Copilot in the field of Huawei cloud data intelligence, 15+ businesses implemented , 2 top papers and 7 patents published.

Jan 2020 - Dec 2020 **New York University,** New York, U.S.
Research Associate (advised by Prof. Claudio Silva & Prof. Enrico Bertini), VIDA Lab

- Lead a survey on the use of visualization for **interpreting machine learning model**, a joint project collaborated with Capital One.
- Developed mTSeer, a visual analytic system for interactive and steerable exploration and evaluation of **multivariate time-series forecasting models** with Financial and News data.
- Participated as a major developer in a project that generates synthetic tabular data for ML.

May 2019 - Aug 2019 **Harvard University,** Boston, U.S.
Visiting Scholar (advised by Prof. Hanspeter Pfister), Visual Computing Group

- Designed and built the visualization part of a biomedical project for improving embryo selection in Assisted Reproductive Technologies, collaborated with Harvard Medical School.

Jan 2019 - May 2019 **Microsoft Research Asia,** Beijing, China
Research Intern (advised Dr. Yun Wang), Software Analytics Group

- Developed **CloudDet**, an interactive system for visually analyzing anomalous performances in large **cloud computing** system.
- Cooperated in designing **DataShot**, a visualization system for **automatically generate the poster** with the sheet data.

Feb 2017 - Sept 2017 **Tongji University,** Shanghai, China
Visiting Scholar (advised Prof. Nan Cao), iDVx Lab

- Designed **ECGLens**, a visualization tool for **arrhythmia detection** with large scale ECG data.
- Developed **EventThread**, a visual analytics system for **summarizing event sequence data.**

Jun 2016 - Dec 2019 **The Hong Kong University of Science and Technology,** Hong Kong, China
Graduate Student, HKUST VIS Lab

- Designed **EnsembleLens**, a visual system to evaluate different anomaly detection algorithms based on **ensemble analysis**.
- Design and build a visualization project for analyzing Hong Kong weather, elderly wandering and asset management, collaborated with LSCM Hong Kong.
- Lead a Research Grant Council (RGC) proposal application for Explainable Machine Learning for Time-Series Data Analysis.

Jun 2014 - Sept 2014 **McGill University,** Montreal, Canada
Summer Intern (advised by Prof. Kirk H. Bevan), Department of Material Engineering

- Provided a model to predict the screening-limited response of nanobiosensors.

Jun 2014 - Sept 2014 **Nanjing University,** Nanjing, China
Project Leader (advised by Prof. Xinggan Zhang)

- Lead "Microphone Array Acoustic Localization and Speech Enhancement", which is a National Innovation Training Program.

Publications

[C10, J7] Qiaomu Shen, Zhengxin You, Xiao Yan, Chaozu Zhang, **Ke Xu,** Jianbin Qin, Dan Zeng, Bo Tang.
QEVIS: Multi-grained Visualizing of Distributed Query Execution.
IEEE Transactions on Visualization and Computer Graphics (VAST'23: Proceedings of the IEEE Visual Analytics Science and Technology), IEEE, 2023. *[24.68% acceptance rate]*

[C9, J6] Yang Shi, Bingchang Chen, Ying Chen, Zhuochen Jin, **Ke Xu,** Xiaohan Jiao, Tian Gao, Nan Cao.
Supporting Guided Exploratory Visual Analysis on Time Series Data with Reinforcement Learning.
IEEE Transactions on Visualization and Computer Graphics (VAST'23: Proceedings of the IEEE Visual Analytics Science and Technology), IEEE, 2023. *[24.68% acceptance rate]*

[J5] Yifang Wang, Hongye Liang, Xinhuan Shu, Jiacheng Wang, **Ke Xu,** Zikun Deng, Cameron Campbell, Bijia Chen, Yingcai Wu, Huamin Qu.

Interactive Visual Exploration of Longitudinal Career Mobility Data.

IEEE Transactions on Visualization and Computer Graphics, doi: 10.1109/TVCG.2021.3067200, IEEE, 2022.

[C8] **Ke Xu,** Jun Yuan, Yifang Wang, Claudio Silva, Enrico Bertini.

mTSeer: Interactive Visual Exploration of Models on Multivariate Time-series Forecast.

CHI'21: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems.

[C7] Brian Barr, **Ke Xe,** Cudio Silva, Enrico Bertini, Robert Reilly, Jason Wittenbach.

Towards Ground Truth Explainability on Tabular Data.

[C6, J4] **Ke Xu,** Yun Wang, Leni Yang, Yifang Wang, Bo Qiao, Qin Si, Yong Xu, Haidong Zhang, Huamin Qu.

CloudDet: Interactive Visual Analysis of Anomalous Performances in Cloud Computing Systems.

IEEE Transactions on Visualization and Computer Graphics (VAST'19: Proceedings of the IEEE Visual Analytics Science and Technology), doi: 10.1109/TVCG.2019.2934, IEEE, 2019. *[24.7% acceptance rate]*

[C5, J3] Yun Wang, Zhida Sun, Haidong Zhang, Weiwei Cui, **Ke Xu,** Xiaojuan Ma, Dongmei Zhang.

DataShot: Automatic Generation of Fact Sheet from Tabular Data.

IEEE Transactions on Visualization and Computer Graphics (InfoVis'19: Proceedings of the IEEE Information Visualization), doi: 10.1109/TVCG.2019.2934398, IEEE, 2019. *[25.8% acceptance rate]*

[C4] Xing Mu***, Ke Xu*,** Qing Chen, Fan Du, Yun Wang, Huamin Qu.

MOOCad: Visual Analysis of Anomalous Learning Activities in Massive Open Online Courses.

EuroVis'19: Proceedings of The Eurographics Conference on Visualization, pages: 91-95, doi: 10.2312/evs.20191176, EuroVis, 2019.

[C3, J2] **Ke Xu,** Meng Xia, Xing Mu, Yun Wang, Nan Cao.

EnsembleLens: Ensemble-based Visual Exploration of Anomaly Detection Algorithms with Multidimensional Data.

IEEE Transactions on Visualization and Computer Graphics (VAST'18: Proceedings of the IEEE Visual Analytics Science and Technology), doi: 10.1109/TVCG.2018.2864825, IEEE, 2018. *[25.6% acceptance rate]*

[C2] **Ke Xu,** Shunan Guo, Nan Cao, David Gotz, Aiwen Xu, Huamin Qu, Zhenjie Yao, Yixin Chen.

ECGLens: Interactive Visual Exploration of Large-scale ECG Data for Arrhythmia Detection.

CHI'18: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, p. 663, doi: 10.1145/3173574.3174237, ACM, 2018. **(*Best Paper Honorable Mention).** *[top 5% of all submissions]*

[C1, J1] Shunan Guo, **Ke Xu,** Rongwen Zhao, David Gotz, Hongyuan Zha, Nan Cao.

EventThread: Visual Summarization and Stage Analysis of Event Sequence Data.

IEEE Transactions on Visualization and Computer Graphics (VAST'17: Proceedings of the IEEE Visual Analytics Science and Technology), doi: 10.1109/TVCG.2017.2745320, IEEE, 2017.

Patents

Ke Xu.
A Chart Selection Method and Data Visualization Device. Application No. CN116541456A, 2022.

Ke Xu, Nan Cao, Zhuochen Jin, Yang Shi, Bingchang Chen.
Data Analysis Methods, Devices and Computing Equipment Clusters based on Cloud Services. Application No. CN202211650218.2, 2022.

Ke Xu, Kangzhan Wang, Chen Yang, Jiang Long, Hong Lu.
Data Query Method, Device, Electronic Equipment and Computer-readable Storage Medium. Application No. CN202211523534.3, 2022.

Ke Xu, Datong Wei, Zhuochen Jin.
Methods, Devices and Storage Media for Displaying Data. Application No. CN202311083420.6, 2023

Changhe Yang, **Ke Xu**.
见解数据生成等方法和装置. Application No. PCT/CN2023/109267, 2022

Zhuochen Jin, Yanda Li, **Ke Xu,** Jiang Long, Hong Lu.
一种图表构建方法及相关设备. Application No. CN202211446392.5, 2022

Changhe Yang, **Ke Xu,** Datong Wei, Jiannan Wang, Jiang Long.
一种数据方法及相关系统. Application No. CN202311075219.3, 2023

Honors and Awards

2022 Pioneer Award, Huawei Hangzhou Research Insititude

2022 Hongshan Award, Huawei Cloud

2021 Huawei "Top Young Talents" Scheme, Huawei

2021 HKUST Oversea Research Award
8K HKD per month for an overseas research.

2019 Research Travel Grant: IEEE VIS 2019, Vancouver, Canada

2018 Research Travel Grant: IEEE VIS 2018, Berlin, Germany

2018 Research Travel Grant: ACM SIGCHI 2018, Montreal, Canada

2018 Best Paper Honorable Mention Award, ACM CHI Conference
For ECGLens. top 5% of all submissions,

2015 -2019 Postgraduate Studentship

2015 Excellent Student of Nanjing University

2014 First Prize of Red Sun Scholarship
Awarded to **30** students in Nanjing University (**10000+**) each year.

2014 Canadian Globalink Research Internship Award

2013 Baosteel Scholarship
Awarded to **2 Sophomores** (3000+) in Nanjing University each year.

2012 National Scholarship
Only awarded once to students with top **1%** academic performance each year.

2010 First Prize, Chinese Chemistry Olympiad (Jiangsu Province)

Invited Talks

Aug 2023 Analysis of Huawei Cloud's Next-generation Business Intelligence Capabilities
Tongji University, Shanghai, China

Jul 2022 DataArts Studio: Typical Scenario Application Preview
Huawei Partner and Developer Conference (HDPC), Hangzhou, China

May 2022 Visualization Research at Huawei
HKUST, Hong Kong, China

May 2021 mTSeer: Interactive Visual Exploration of Models on Multivariate Time-series Forecast
ACM CHI Conference, Yokohama, Japan.

Mar 2020 Visual Anomaly Detection and Its Applications with Temporal Data
New York University, New York, U.S.

Oct 2019 CloudDet: Interactive Visual Analysis of Anomalous Performances in Cloud Computing Systems
IEEE VIS Conference, Vancouver, Canada.

Oct 2018 EnsembleLens: Ensemble-based Visual Exploration of Anomaly Detection Algorithms with Multidimensional Data
IEEE VIS Conference, Berlin, Germany.

Apr 2018 ECGLens: Interactive Visual Exploration of Large Scale ECG Data for Arrhythmia
ACM CHI Conference, Montreal, Canada.

Teaching Experience

2019 Teaching Assistance, **Visualization: Connections with Machine Learning,** New York University

2017 Teaching Assistance**, Digital Circuit,** HKUST

2016 - 2018 Teaching Assistance, **Signals and Systems,** HKUST

Services

Program Committee of IEEE VIS 2020

Reviewer of IEEE Transactions on Visualization and Computer Graphics (TVCG)

Reviewer of IEEE VIS (VAST, InfoVis, and SciVis) Conference

Reviewer of ACM Conference on Human Factors in Computing Systems (CHI)

Reviewer of The Visual Computer Journal (TVCJ), Springer

Reviewer of Computer Science Review (CSR), Elsevier

Volunteer of IEEE VIS (VAST, InfoVis, and SciVis) Conference