徐科

纽约大学
Tandon 工学院，纽约
✉ kexu@nyu.edu
📞 (+1) 3472219941
📞 (+86) 13681912504

教育背景

Sept 2015
- Aug 2019

Ph.D. in Electronic and Computer Engineering

香港科技大学，香港特别行政区， 中国

- 导师: 屈华民教授
- 博士论文: Visual Anomaly Detection and Its Applications.

Sept 2011
- Jul 2015

B.S. in Electronic Science and Technology

南京大学，南京，中国

- 排名: 1/217.
- 论文: FPGA-based Design of FFT & FIR.

研究兴趣

Visual Analytics (可视分析), Big Data (大数据分析), Anomaly Detection (异常检测), Explainable AI (可解释 AI), Time-series Analytics (时序分析), Healthcare (医疗)

研究 / 工作经历

Jan 2020
- Present

纽约大学， 纽约，美国

博士后 (advised by Prof. Claudio Silva & Prof. Enrico Bertini), VIDA Lab

- 主导一项用可视化**解释机器学习**模型的调研工作，与 Capital One 合作。
- 主导开发了 mTSeer，一个用于**评估多维时序数列预测**模型 (金融、新闻数据等) 的交互式、可操作的可视分析系统。
- 作为主要开发者与 Capital One 合作一项为机器学习产生**合成数据**的项目。

May 2019
- Aug 2019

哈佛大学， 波士顿，美国

访问学者 (advised by Prof. Hanspeter Pfister), Visual Computing Group

- 设计和搭建了一项生物医学项目的部分可视化系统来提高辅助生殖技术中的受精卵选择，与哈佛医学院合作。

Jan 2019
- May 2019

微软亚洲研究院， 北京，中国

研究实习生 (advised Dr. Yun Wang), Software Analytics Group

- 主导开发了 CloudDet，一个用于交互式分析**云计算平台**中的异常行为的可视化系统。
- 合作设计了 Datashot，一个可以从表格数据**自动生成海报**的可视化系统。

Feb 2017 - Sept 2017	**同济大学，**上海，中国

研究实习生 (advised <u>Prof. Nan Cao</u>), iDVx Lab

- 主导开发了 ECGLens，一个用于从心电图中检测**心率失常**的可视化**辅疗系统**。
- 设计开发了 EventThread，一个用于总结 event sequence 数据演变的可视分析系统。

Jun 2016 - Dec 2019 **香港科技大学，**香港，中国

博士生, HKUST VIS Lab

- 开发了可视分析系统 EnsembleLens，基于 ensemble 方法来评估不同的异常检测算法。
- 设计开发了一个可视分析系统，帮助香港物流及供應鏈多元技術研發中心 (LSCM) 综合分析香港天气，老人走失，和固定资产管理等问题。
- 作为主要贡献者负责一项香港研究基金申请 (Research Grant Council)，用于对时序数据的机器学习模型进行可解释性分析。

Jun 2014 - Sept 2014 **麦吉尔大学，**蒙特利尔，加拿大

暑期实习生 (advised by <u>Prof. Kirk H. Bevan</u>), Department of Material Engineering

- 提供了一个模型来预测纳米生物传感器的筛选受限反应。

Jun 2014 - Sept 2014 **南京大学，**南京，中国

项目领导者 (advised <u>by Prof. Xinggan Zhang</u>)

- 主导了一项**国家级创新训练项目** -- Microphone Array Acoustic Localization and Speech Enhancement.

论文

[A+级] **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.

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

Towards Ground Truth Explainability on Tabular Data.

ICML 2020 (WHI).

[1 区+ A 级] **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]*

[1 区+ A 级] 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]*

[B 级] 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.

[1 区 + A 级] **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]*

[A+级] **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]*

[1 区 + A 级] 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.

Submitted

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

CareerFlow: Interactive Visual Analytics System for Large-Scale Longitudinal Career Mobility Data.
TVCG.

奖励与荣誉

2019　海外交流奖学金, HKUST

2019　参会奖学金, IEEE VIS 2019

2018　最佳论文提名奖, ACM CHI Conference [A+]
　　　获奖文章为 ACM CHI 2018 ECGLens. 所有投稿的 top 5% 获奖

2018　参会奖学金, IEEE VIS 2018, ACM SIGCHI 2018

2015
-2019　博士奖学金, HKUST

2015　南京大学优秀毕业生

2014　红太阳奖学金一等奖
　　　每年从整个南京大学选拔奖励 30 个学生

2014　Canadian Globalink Research Internship Award

2013　宝钢奖学金
　　　奖励给 2 名南京大学二年级学生.

2012　国家奖学金
　　　每名学生只能获奖一次

2010　江苏省化学奥林匹克竞赛一等奖

受邀演讲

Mar 2020 Visual Anomaly Detection and Its Applications with Temporal Data
纽约大学，纽约，美国

Oct 2019 CloudDet: Interactive Visual Analysis of Anomalous Performances in Cloud Computing Systems
IEEE VIS 会议，温哥华，加拿大

Oct 2018 EnsembleLens: Ensemble-based Visual Exploration of Anomaly Detection Algorithms with Multidimensional Data
IEEE VIS 会议，柏林，德国

Apr 2018 ECGLens: Interactive Visual Exploration of Large-Scale ECG Data for Arrhythmia
ACM CHI 会议，蒙特利尔，加拿大

教学经历

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

学术服务

2020 **Program Committee** of IEEE VIS 2020

2018 - 2020 **Reviewer** of IEEE Transactions on Visualization and Computer Graphics (TVCG)

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

2019 **Reviewer** of ACM Conference on Human Factors in Computing Systems (CHI)

2019, 2020 **Reviewer** of The Visual Computer Journal (TVCJ), Springer

2018, 2019 **Volunteer** of IEEE VIS (VAST, InfoVis, and SciVis) Conference

（后附英文版）

Ke Xu

New York University
Tandon School of Engineering, New York
✉ kexu@nyu.edu
📞 (+1) 3472219941
📞 (+86) 13681912504

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

Visual Analytics, Anomaly Detection, Explainable AI, Time-series Analytics, Healthcare

Research / Work Experience

Jan 2020 - Present
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 <u>Prof. Kirk H. Bevan</u>), 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 <u>by Prof. Xinggan Zhang</u>) |

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

Publications

[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.
ICML 2020 (WHI).

[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.

Submitted

Yifang Wang, Hongye Liang, Jiacheng Wang, **Ke Xu,** Xinhuan Shu, Cameron Campbell, Bijia Chen, Yingcai Wu,
Huamin Qu.
CareerFlow: Interactive Visual Analytics System for Large-Scale Longitudinal Career Mobility Data.
TVCG.

Honors and Awards

2019	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

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

2020   **Program Committee** of IEEE VIS 2020

2018 - 2020   **Reviewer** of IEEE Transactions on Visualization and Computer Graphics (TVCG)
Reviewer of IEEE VIS (VAST, InfoVis, and SciVis) Conference

2019   **Reviewer** of ACM Conference on Human Factors in Computing Systems (CHI)

2019, 2020   **Reviewer** of The Visual Computer Journal (TVCJ), Springer

2018, 2019   **Volunteer** of IEEE VIS (VAST, InfoVis, and SciVis) Conference