# Yue Zhao

CONTACT INFORMATION	<pre>     yzhao010@usc.edu     github.com/yzhao062     in linkedin.com/in/yzhao062     viterbi-web.usc.edu/~yzhao010/</pre>	213-821-2369 CS Department, SAL 104 Los Angeles, CA United States, 90089 Department of Computer Science University of Southern California
RESEARCH SUMMARY	<ol> <li>I build robust, efficient, and automated machine learning (ML) and data mining (DM) algorithms, systems, and applications. My primary areas of interest are:</li> <li>Robustness and Security of AI: Enhancing the robustness and security of AI systems through out-of-distribution (OOD) detection, outlier detection, and anomaly detection.</li> <li>Efficient and Scalable AI: Developing efficient and scalable ML systems and automation techniques.</li> <li>Applications in Security, Finance, and Healthcare: Applying AI technologies to address complex problems in security, finance, and healthcare sectors.</li> </ol>	
	(1) Robustness and Security of AI	
	<ul><li>☐ Out-of-distribution (OOD) Detection</li><li>☐ Outlier Detection</li></ul>	<ul><li>□ Anomaly Detection</li><li>□ Trustworthy AI</li></ul>
	(2) Efficient and Scalable AI	
	<ul> <li>□ Machine Learning Systems</li> <li>□ Automated Machine Learning</li> <li>□ Decentralized Learning</li> </ul>	<ul><li>□ Meta-Learning</li><li>□ Parallel Computing</li><li>□ Quantization and Approximation</li></ul>
	(3) Applications in Security, Finance, and Healthcare	
	☐ Healthcare AI ☐ AI for Security	<ul><li>□ Financial Risk Modeling</li><li>□ AI for Science</li></ul>
OPEN-SOURCE HIGHLIGHTS YZHAD062	<b>Open-source Contribution</b> : I have led or contributed as a core developer to more than 10 ML open-source initiatives. Popular ones include PyOD (A Python Toolbox for Scalable Outlier Detection), ADBench (Anomaly Detection Benchmark), and TDC (An ML Data Hub for Drug Discovery).	
	My works receive ♠♠20,000 GitHub Stars and 20,000,000 downloads as of August 22, 2024.	
FULL-TIME University of Southern California  PROFESSIONAL Thomas Lord Department of Computer Science  EXPERIENCE Assistant Professor (Tenure-Track) Aug  Robustness, Efficiency, Security, Automation, and ApplIcation Lab (RESAIL) La		Aug. 2023 - Present n <u>L</u> ab ( <b>RESAIL</b> ) Lab (Link)
	PwC Canada Consulting & Deals	
	Senior Consultant (Data Scientist) Consultant (Data Scientist) Research Associate (Intern)	Aug. 2017 - Jun. 2019 Feb. 2017 - Jul. 2017 May. 2016 - Jan. 2017
EDUCATION	Carnegie Mellon University	Pittsburgh, PA
	<ul><li>Ph.D. in Information Systems and Management</li><li>Affiliation: CMU automated learning systems group (Cat</li></ul>	Sep. 2019 - May. 2023 alyst) and Data Analytics Techniques

Algorithms (DATA) Lab

• Advisors and Mentors: CMU: Prof. Leman Akoglu, Prof. Zhihao Jia, and Prof. George Chen. I collaborate with Prof. Jure Leskovec at Stanford, and Prof. Philip S. Yu at UIC.

University of Toronto

Toronto, ON

Master of Science in Computer Science

Sep. 2015 - Dec. 2016

#### University of Cincinnati

Cincinnati, OH

Bachelor of Science in Computer Engineering Minor: Computer Science and Mathematics

Sep. 2010 - May. 2015

AWARDS, GRANTS, AND FUNDING

Amazon Research Awards	Aug. 2024
Best Paper Award @ KDD Resource-Efficient Learning Workshop	Aug. 2024
NSF ATD	Aug. 2024
NSF POSE	Jun. 2024
Google Cloud Research Innovators	Mar. 2024
AAAI New Faculty Highlights	Feb. 2024
Meta 2022 AI4AI Research Award (student co-PI)	Oct. 2022
The Norton Labs Graduate Fellowship	Mar. 2022
CMU Presidential Fellowship	2019
Mitacs-Accelerate Research and Development Funding	2016-2017
University Global Award and Scholarship	2010-2015
Mantei/Mae Award & Scholar	2012-2015
Engineer of the Month	Jun. 2014

# PUBLICATIONS Preprints & Under Submission



42. Hao Dong, Yue Zhao, Eleni Chatzi, Olga Fink

MultiOOD: Scaling Out-of-Distribution Detection for Multiple Modalities

Under submission

arXiv preprint arXiv:2405.17419

41. Hao Dong, Gaetan Frusque, Yue Zhao, Eleni Chatzi, Olga Fink

NNG-Mix: Improving Semi-supervised Anomaly Detection with Pseudo-anomaly Generation

Under submission

arXiv preprint arXiv:2311.11961

40. Mingi Jiang, Chaochuan Hou, Ao Zheng, Xiyang Hu, Songqiao Han, Hailiang Huang, Xiangnan He, Philip S. Yu, Yue Zhao

Weakly Supervised Anomaly Detection: A Survey

Under submission

arXiv preprint arXiv:2302.04549

#### Peer-reviewed Journal Papers

39. Ling Yang\*, Zhilong Zhang\*, Yang Song, Shenda Hong, Runsheng Xu, Yue Zhao, Wentao Zhang, Bin Cui, Ming-Hsuan Yang

Diffusion Models: A Comprehensive Survey of Methods and Applications

ACM Computing Surveys (CSUR), 2023

(\*equal contribution)

38. Yue Zhao\*, Martin Q. Ma\*, Xiaorong Zhang, Leman Akoglu

The Need for Unsupervised Outlier Model Selection: A Review and Evaluation of Internal Evaluation Strategies

ACM SIGKDD Explorations Newsletter (SIGKDD Explor.), 2023 (\*equal contribution)

37. Kexin Huang\*, Tianfan Fu\*, Wenhao Gao\*, Yue Zhao, Yusuf Roohani, Jure Leskovec, Connor W. Coley, Cao Xiao, Jimeng Sun, Marinka Zitnik Artificial Intelligence Foundation for Therapeutic Science

Yue Zhao - CV

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- Nature Chemical Biology (**NCHEMB**), 2022 (\*equal contribution)
- 36. <u>Yue Zhao\*</u>, Zheng Li\*, Xiyang Hu, Nicola Botta, Cezar Ionescu, George H. Chen ECOD: Unsupervised Outlier Detection Using Empirical Cumulative Distribution Functions *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 2022. (\*equal contribution)
- 35. <u>Yue Zhao</u>, Zain Nasrullah, Zheng Li PyOD: A Python Toolbox for Scalable Outlier Detection Journal of Machine Learning Research (JMLR), 2019.

# Peer-reviewed Conference & Workshop Papers (with proceedings)

- 34. Xueying Ding, <u>Yue Zhao</u>, Leman Akoglu
  Fast Unsupervised Deep Outlier Model Selection with Hypernetworks

  ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2024
- 33. Lichao Sun, Yue Huang, Haoran Wang, Siyuan Wu, Qihui Zhang, Chujie Gao, Yixin Huang, Wenhan Lyu, Yixuan Zhang, Xiner Li, Zhengliang Liu, Yixin Liu, Yijue Wang, Zhikun Zhang, 50+ collaborative authors, Yue Zhao
  - TrustLLM: Trustworthiness in Large Language Models International Conference on Machine Learning (ICML), 2024
- 32. Songtao Liu, Hanjun Dai, <u>Yue Zhao</u>, Peng Liu Preference Optimization for Molecule Synthesis with Conditional Residual Energy-based Models International Conference on Machine Learning (ICML), Oral, 2024
- 31. <u>Yue Zhao</u>, Leman Akoglu
  Hyperparameter Optimization for Unsupervised Outlier Detection
  International Conference on Automated Machine Learning (AutoML), 2024
- 30. <u>Yue Zhao</u>
  Towards Reproducible, Automated, and Scalable Anomaly Detection

  AAAI Conference on Artificial Intelligence (AAAI), New Faculty Highlights, 2024
- 29. Minqi Jiang\*, Chaochuan Hou\*, Ao Zheng\*, Songqiao Han, Hailiang Huang<sup>†</sup>, Qingsong Wen, Xiyang Hu<sup>†</sup>, Yue Zhao<sup>†</sup> ADGym: Design Choices for Deep Anomaly Detection. Advances in Neural Information Processing Systems (NeurIPS), 2023 (<sup>†</sup>Corresponding author)
- Jaemin Yoo, <u>Yue Zhao</u>, Lingxiao Zhao, Leman Akoglu
  DSV: An Alignment Validation Loss for Self-supervised Outlier Model Selection
  European Conference on Machine Learning and Principles and Practice of Knowledge Discovery
  in Databases (ECML/PKDD), 2023
- 27. Peng Xu, Lin Zhang, Xuanzhou Liu, Jiaqi Sun, Yue Zhao, Haiqin Yang, Bei Yu Do Not Train It: A Linear Neural Architecture Search of Graph Neural Networks International Conference on Machine Learning (ICML), 2023
- 26. Yue Zhao, Guoqing Zheng, Subhabrata Mukherjee, Robert McCann, Ahmed Awadallah ADMoE: Anomaly Detection with Mixture-of-Experts from Noisy Labels Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI), 2023
- Yue Zhao, George H. Chen, Zhihao Jia
   TOD: GPU-accelerated Outlier Detection via Tensor Operations

   International Conference on Very Large Data Bases (VLDB), 2023
- 24. Songqiao Han\*, Xiyang Hu\*, Hailiang Huang\*, Minqi Jiang\*, <u>Yue Zhao\*</u> ADBench: Anomaly Detection Benchmark Advances in Neural Information Processing Systems (NeurIPS), 2022 (\*equal contribution & the corresponding author)

- 23. Yue Zhao\*, Kay Liu\*, Yingtong Dou\*, et al. Benchmarking Node Outlier Detection on Graphs Advances in Neural Information Processing Systems (NeurIPS), 2022 (\*equal contribution)
- Yue Zhao, Xiaorong Zhang, Leman Akoglu
   ELECT: Toward Unsupervised Outlier Model Selection
   IEEE International Conference on Data Mining (ICDM), 2022.
   Regular paper. Acceptance rate 9.77% (85/870); overall acceptance 20% (174/870).
- 21. Zhiming Xu, Xiao Huang, <u>Yue Zhao</u>, Yushun Dong, Jundong Li Contrastive Attributed Network Anomaly Detection with Data Augmentation Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), 2022 Acceptance rate 19%.
- Yue Zhao, Ryan A. Rossi, Leman Akoglu
   Automatic Unsupervised Outlier Model Selection
   Advances in Neural Information Processing Systems (NeurIPS), 2021
   Acceptance rate 26%.
- 19. Kwei-Herng Lai, Daochen Zha, Junjie Xu, <u>Yue Zhao</u>, Guanchu Wang, Xia Hu Revisiting Time Series Outlier Detection: Definitions and Benchmarks *Advances in Neural Information Processing Systems* (*NeurIPS*), 2021
- 18. Kexin Huang\*, Tianfan Fu\*, Wenhao Gao\*, Yue Zhao, Yusuf Roohani, Jure Leskovec, Connor W. Coley, Cao Xiao, Jimeng Sun, Marinka Zitnik Therapeutics Data Commons: Machine Learning Datasets and Tasks for Drug Discovery and Development Advances in Neural Information Processing Systems (NeurIPS), 2021 (\*equal contribution)
- 17. Yue Zhao\*, Xiyang Hu\*, Cheng Cheng, Cong Wang, Changlin Wan, Wen Wang, Jianing Yang, Haoping Bai, Zheng Li, Cao Xiao, Yunlong Wang, Zhi Qiao, Jimeng Sun, Leman Akoglu SUOD: Accelerating Large-scale Unsupervised Heterogeneous Outlier Detection Conference on Machine and Learning Systems (MLSys), 2021.

  Acceptance rate 23.5% (52/221). (\*equal contribution)
- 16. Kwei-Herng Lai\*, Daochen Zha\*, Guanchu Wang, Junjie Xu, <u>Yue Zhao</u>, Devesh Kumar, Yile Chen, Purav Zumkhawaka, Minyang Wan, Diego Martinez and Xia Ben Hu TODS: An Automated Time Series Outlier Detection System (Demo paper) Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI), 2021. (\*equal contribution)
- 15. Meng-Chieh Lee, <u>Yue Zhao</u>, Aluna Wang, Pierre Jinghong Liang, Leman Akoglu, Vincent S. Tseng, Christos Faloutsos AutoAudit: Mining Accounting and Time-Evolving Graphs IEEE International Conference on Biq Data (Biq Data), 2020
- 14. Changlin Wan, Dongya Jia, <u>Yue Zhao</u>, Wennan Chang, Sha Cao, Xiao Wang, and Chi Zhang A Data Denoising Approach to Optimize Functional Clustering of Single Cell RNA-sequencing Data
  - IEEE International Conference on Bioinformatics and Biomedicine (BIBM), 2020
- Zheng Li, <u>Yue Zhao</u>, Nicola Botta, Cezar Ionescu, Xiyang Hu COPOD: Copula-Based Outlier Detection IEEE International Conference on Data Mining (ICDM), 2020.
- Zheng Li, <u>Yue Zhao</u>, Jialin Fu SYNC: A Copula based Framework for Generating Synthetic Data from Aggregated Sources IEEE International Conference on Data Mining Workshops (ICDMW), 2020.

- Yiqun Mei, <u>Yue Zhao</u>, Wei Liang DSR: An Accurate Single Image Super Resolution Approach for Various Degradations IEEE International Conference on Multimedia and Expo (ICME), 2020, London, UK.
- 10. Yue Zhao, Xuejian Wang\*, Cheng Cheng\*, Xueying Ding\* Combining Machine Learning Models and Scores using combo Library (Demo paper) Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI), 2020. (\*equal contribution)
- 9. Zain Nasrullah, <u>Yue Zhao</u>
  Music Artist Classification with Convolutional Recurrent Neural Networks *IEEE International Joint Conference on Neural Networks (IJCNN)*, 2019, Hungary.
- 8. <u>Yue Zhao</u>, Zain Nasrullah, Maciej K. Hryniewicki, Zheng Li LSCP: Locally Selective Combination in Parallel Outlier Ensembles *SIAM International Conference on Data Mining* (*SDM*), 2019, Calgary, Canada. Acceptance rate 22.7% (90/397).
- 7. <u>Yue Zhao</u>, Maciej K. Hryniewicki XGBOD: Improving Supervised Outlier Detection with Unsupervised Representation Learning *IEEE International Joint Conference on Neural Networks (IJCNN*), 2018, Rio, Brazil.
- Yue Zhao, Maciej K. Hryniewicki, Francesca Cheng, Boyang Fu, Xiaoyu Zhu Employee Turnover Prediction with Machine Learning: A Reliable Approach Intelligent System Conference (Intellisys), 2018, London, UK. Acceptance rate 34% (194/568).
- Yue Zhao\*, Zhongtian Qiu\*, Yiqing Yang\*, Weiwei Li\*, Mingming Fan An Empirical Study of Touch-based Authentication Methods on Smartwatches ACM International Symposium on Wearable Computers (ISWC), 2017, Maui, USA. Acceptance rate 25.6% (23/90). (\*equal contribution)

#### Peer-reviewed Workshop Papers (without proceedings)

- 3. <u>Yue Zhao</u>, Xueying Ding, Jianing Yang, Haoping Bai. SUOD: Toward Scalable Unsupervised Outlier Detection *Workshops at the Thirty-Fourth AAAI Conference on Artificial Intelligence*, 2020. Extended version published in *MLSys 2021*.
- Colin Wan, Zheng Li, Alicia Guo, <u>Yue Zhao</u>
   SynC: A Unified Framework for Generating Synthetic Population with Gaussian Copula
   Workshops at the Thirty-Fourth AAAI Conference on Artificial Intelligence, 2020.
   Extended version published in ICDMW 2020.
- Yue Zhao, Maciej K. Hryniewicki
  DCSO: Dynamic Combination of Detector Scores for Outlier Ensembles
  ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD
  Workshop on Outlier Detection De-constructed), 2018, London, UK.
  Extended version published in SDM 2019, renamed to LSCP.

### Internship Experience

#### NortonLifeLock Research Group

Machine Learning Research Intern

2022

• Supervised by Dr. Acar Tamersoy and Dr. Kevin Roundy.

### Microsoft Research

Machine Learning Research Intern

2022

- Designed weakly supervised anomaly detection algorithms
- Supervised by Dr. Guoqing Zheng and Dr. Subhabrata (Subho) Mukherjee.

# Stanford University, Computer Science Department

Visiting Student Researcher

2021

- Designed new GNN systems.
- Supervised by Prof. Jure Leskovec.

### IQVIA, Analytics Center of Excellence

Machine Learning Research Intern

2020

- Designed new machine learning models in healthcare.
- Supervised by Dr. Cao (Danica) Xiao (IQVIA) and Prof. Jimeng Sun (UIUC).

### Siemens PLM Software USA

Software Engineer (Intern & Contract)

Mar. 2012 - Dec. 2014

- Managed a Java project to transition the LabManager system to vCloud Director.
- Refactored outdated automation code and added new modules and JUnit test cases.
- Led a C++ Code Coverage project on Teamcenter platform to strengthen its stability.

# TEACHING EXPERIENCE

# University of Southern California

Los Angeles, CA

Spring 2025 (scheduled)

CSCI 566 Deep Learning and Its Applications

Instructor

Spring 2024

CSCI 566 Deep Learning and Its Applications

# $Carnegie\ Mellon\ University$

Pittsburgh, PA

Fall 2022

Teaching Assistant

Instructor

Managing Digital Business (Prof. David Riel)

Teaching Assistant & co-Instructor (lectures on AutoML and MLSys)	Spring 2022
Teaching Assistant & co-Instructor (lectures on AutoML and MLSys)	Fall 2021
Teaching Assistant & co-Instructor (lectures on AutoML)	Spring 2021
Teaching Assistant & co-Instructor (lectures on AutoML)	Fall 2020
Intro to Artificial Intelligence (Prof. David Stoier)	

Intro to Artificial Intelligence (Prof. David Steier)

#### Teaching Assistant

Spring 2022

Digital Transformation (Prof. David Riel)

#### **Teaching Assistant** (helping on course topics)

Statistics for IT Managers (Prof. Daniel Nagin)

Fall 2021

# University of Toronto

Toronto, ON

Cincinnati, OH

Teaching Assistant & Lab Session Instructor

Embedded Systems (Prof. Philip Anderson)

Fall 2015

#### University of Cincinnati

# Teaching Assistant & Lab Session Instructor

Fall 2014

Intro to Programming (Prof. George Purdy)

# PH.D. STUDENTS

- Haoyan Xu (USC, ECE Ph.D., 2024 Spring-)
- Yuehan Qin (USC, CS Ph.D., 2024 Fall-)
- Tiankai Yang (USC, CS Ph.D., 2024 Fall-)
- Li Li (USC, CS Ph.D., 2024 Fall-)

# & Thesis Committee

- QUALIFICATION Gengyu Rao (USC, CS Ph.D.)
  - Mehrdad Kiamari (USC, ECE Ph.D.)
  - Haonan Wang (USC, ECE Ph.D.)
  - Yuan Meng (USC, ECE Ph.D.)
  - Hassan Hamad (USC, ECE Ph.D.)
  - Yizhou Zhang (USC, CS Ph.D.)
  - Haoming Li (USC, CS Ph.D.)
  - Arash Hajisafi (USC, CS Ph.D.)
  - Yi Chien Lin (USC, ECE Ph.D.)
  - Yuke Zhang (USC, ECE Ph.D.)

#### Services

# Conference Organizing Committee

• Workflow Co-Chair for KDD 2023

# External Reviewer for Funding Proposals

• Dutch Research Council (NWO)

#### Journal Editor

- Associate Editor, IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- Action Editor, Journal of Data-centric Machine Learning Research (DMLR)

# Program Committee (PC) or Area Chair (AC) for Conferences and Workshops

- ICLR 2025 (AC)
- AAAI 2025 (Senior PC)
- ICML 2024 (AC)
- AISTATS 2024 (AC)
- MLSys 2024
- KDD 2020, 2021, 2022, 2023
- IJCAI 2022, 2023
- NeurIPS 2021, 2022, 2023
- AAAI 2021, 2022, 2023
- AAAI Demonstrations 2021, 2022
- MICCAI 2020, 2021, 2022
- ICDM 2020
- KDD Workshop on Outlier Detection and Description (ODD), 2021
- KDD Workshop on Anomaly and Novelty Detection (ANDEA), 2021, 2022
- IJCAI Workshop on Artificial Intelligence for Anomalies and Novelties (AI4AN), 2020, 2021
- INFORMS Workshop on Data Science 2021

#### Journal Reviewer

- Journal of Machine Learning Research (JMLR)
- PNAS Nexus
- Machine Learning
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- IEEE Internet of Things Journal (IoT-J)
- IEEE Intelligent Systems
- IEEE Journal on Selected Areas in Communications (J-SAC)
- Data Mining and Knowledge Discovery (DMAI)
- ACM Transactions on Management Information Systems (TMIS)
- Knowledge and Information Systems (KAIS)

- INFORMS Journal on Computing (IJOC)
- Big Data
- Artificial Intelligence Review (AIRE)
- Neurocomputing
- IEEE Transactions on Systems, Man, and Cybernetics: Systems
- IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB)
- IEEE Network Magazine

LinkedIn Anti-Abuse AI

- IEEE Computational Intelligence Magazine (CIM)
- BioData Mining

Talks and

- European Journal of Management and Business Economics (EJMBE)
- The Journal of Open Source Software (JOSS)

LECTURES	Amazon Security AI	Outlier Detection: Automation, Systems, and GenAI
	New York University	Outlier Detection: Automation, Systems, and GenAI
	University of Washington	Outlier Detection: Automation, Systems, and GenAI
	Microsoft	Outlier Detection: Automation, Systems, and GenAI
	USC Retreat on AI and En-	Safety Measures for LLMs
	gineering Safety	
	Visa Research	Towards Reproducible, Automated, and Scalable AD
	USC Symposium on Fron-	Generative AI for Anomaly Detection
	tiers of Generative AI AAAI New Faculty High-	Towards Reproducible, Automated, and Scalable AD

AAAI New Faculty High-	Towards Reproducible, Automated, and Scalable AD	Feb. 2024
lights (invited)		
U of Nevada, Las Vegas	Automated and Scalable ML Algorithms and Systems	Oct. 2023
Samsung Seminar	Automated and Scalable Anomaly Detection Systems	Aug. 2023
KDD SoCal Day	Enable Applications by ML with Noisy Inputs	Aug. 2023
CMU Catalyst	How (Not) to Fail Your Academic Job Search	May. 2023
KAUST	Automated and Scalable ML Algorithms and Systems	Apr. 2023
Emory University	Automated and Scalable ML Algorithms and Systems	Apr. 2023
USC	Automated and Scalable ML Algorithms and Systems	Mar. 2023

Outlier Detection: Automation, Systems, and GenAI

Aug. 2024 Aug. 2024

Aug. 2024 Jun. 2024

Jun. 2024

Apr. 2024

Apr. 2024 Mar. 2024

Mar. 2023Feb. 2023Feb. 2023Feb. 2023Jan. 2023Nov. 2022

Oct. 2022

Automated and Scalable ML Algorithms and Systems
Automated and Scalable ML Algorithms and Systems
Automated and Scalable ML Algorithms and Systems
Automated and Scalable ML Algorithms and Systems
Automated and Scalable ML Algorithms and Systems
Automated and Scalable ML Algorithms and Systems
Automated and Scalable ML Algorithms and Systems
Guest Lecture Automated Anomaly Detection
Large-scale Graph Anomaly Detection

Intuit	Anomaly Detection for Financial Risk Modeling	Aug. 2022
Rice University	Large-scale Anomaly Detection with Automation	Sep. 2022
Microsoft Research	Weakly-supervised Anomaly Detection	Sep. 2022
Wells Fargo	Anomaly Detection for Financial Risk Modeling	Aug. 2022
Columbia University	Guest Lecture Anomaly Detection	Jul. 2022
Morgan Stanley	Automated Outlier Detection	Jun. 2022
Migragoft Dagaarah	Automated Outlier Detection	Iun 2022

Microsoft Research	Automated Outlier Detection	Jun. 2022
Morgan Stanley	Large-scale Anomaly Detection Systems	Mar. 2022
Rutgers Business School	Outlier Model Selection	Mar. 2022
Tesla	Large-scale Anomaly Detection Systems	Feb. 2022
Catalyst, CMU	Systems for Data Mining Algorithms	Dec. 2021

E&Y Canada ML applications in Data Analytics Oct. 2021 University of Nottingham General Machine Learning Applications Jan. 2021