

Cuneyt Gurcan Akcora

University of Central Florida

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Research Interests

- Explainable artificial intelligence
- Data Science on complex networks, large scale graph analysis
- Nonparametric statistics, bootstrap on graphs
- Deep learning and graph mining on Blockchain networks
- Machine learning for privacy and security research on online social networks
- Topological data analysis

Work Experience

- **2023 - now: University of Central Florida, Orlando, FL, USA**
 - ◊ *Associate Professor of Finance, and Computer Science*
 - ◊ *Faculty at the AI Institute*
 - ◊ *Candidacy talk title: Topological Graph Machine Learning*
- **2019 - adjunct since 2023: University of Manitoba, Winnipeg, MB, Canada**
 - ◊ *Assistant Professor of Computer Science, and Statistics*
 - ◊ *Faculty at Data Science Nexus*
 - ◊ *Candidacy talk title: Statistical Graph Mining: from Social Networks and Event Logs to Blockchain*
- **2016 - 2019: University of Texas at Dallas, TX, USA**
 - ◊ *Postdoctoral Fellow at Computer Science, and Statistics*
 - ◊ *Joint work: Murat Kantarcioglu (CS) and Yulia Gel (Stat.)*
- **2015 - 2016: Huawei Research, Istanbul, Turkey**
 - ◊ *Research Engineer. Intelligent Search Group*
- **2014: Qatar Computing Research Institute (QCRI), Doha, Qatar**
 - ◊ *Research Associate. Data Analytics Group*

Education

- **2010-2014: Università degli Studi dell'Insubria, Varese, Italy**
 - ◊ *Thesis: Profiling user interactions on online social networks*
 - ◊ *Ph.D. in Computer Science*
 - ◊ *Advisors: Elena Ferrari and Barbara Carminati*
- **2012 Feb-Apr: University of Texas at Dallas, Dallas, TX, USA**
 - ◊ *Visiting researcher, Computer Science*
 - ◊ *Advisor: Murat Kantarcioglu*
- **2008-2010: State University of New York at Buffalo, Buffalo, NY, USA**

- ◊ *M.Sc. in Computer Science and Engineering*
- ◊ *Thesis: Using Microblogs for Crowdsourcing and Public Opinion Mining*
- ◊ Advisor: Murat Demirbas
- **2005-2006: Gent University, Gent, Belgium**
 - ◊ *Electronics and Information Systems*
 - ◊ *Erasmus Exchange Student*
- **2002-2007: Karadeniz Technical University, Trabzon, Turkey**
 - ◊ *B.Sc. in Electrical and Electronics Engineering*

Honors and Awards

- ◊ Fulbright Scholar to USA, 2008-2010.
- ◊ Amazon Web Services Research Grant, 2013.
- ◊ NSF travel award for SAMSI at Duke University, 2017.
- ◊ IBM travel award for SIGKDD, July 2010.
- ◊ IEEE travel award for ICDM, December 2012.
- ◊ Graduated as an honor student from Karadeniz Technical University, 2007.

Postdoctoral Researchers

2022 Dec - Current **Md. Zulfikar Alom**
 ◊ *Computer Science*

Graduate Students

2023 Sep - Current **Baha Rababah - co-supervised with Carson Leung**
 ◊ *PhD student in Computer Science*

2021 Jan - Current **Poupak Azad**
 ◊ *PhD student in Computer Science*

2021 Sep - Current **Funmilola Mary Taiwo**
 ◊ *PhD student in Statistics*

2021 Sep - Current **Kiarash Shamsi**
 ◊ *PhD student in Computer Science*

2020 - 2022 **Asif Neloy with Max Turgeone**
 ◊ *Msc. in Computer Science*
 ◊ Thesis: Disentangled conditional variational autoencoder for unsupervised anomaly detection.

2020 - 2022 **Md. Abdullah Al Mamun with Rasit Eskicioglu**
 ◊ *Msc. in Computer Science*
 ◊ Thesis: Real-time integration of IoT sensor and IOTA tangle for securing IoT infrastructure.

Undergraduate Students

2024 - Current **Ronan Buck, UCF CS**

2023 - Current **Bao Ngo, UM CS**

2022 - 2024 **Jason Chu, UM CS**

2023 - 2023 **Shuya Zhi, UM CS**

2021 - 2022 **Blessings Manatsa**
 ◊ *Mitacs Business Strategy Grantee in Computer Science*

Internships

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|----------------------|--|
| 2012 Jun-Aug | Yahoo! Research Barcelona
◊ <i>Advisor: Francesco Bonchi</i> |
| 2005 July-Aug | University of Cairo , Cairo, Egypt
◊ IAESTE Student Program |

Military Service

- | | |
|----------------------------|---|
| 2014 Nov - 2015 Apr | Private, Nigde Il Jandarma Komutanligi , Nigde, Turkey |
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Grants

Internal grants

- **FoS 2021-2022:** With Xuemiao Hao (Actuaries), A Comprehensive Analysis of Use Cases and Application Domains of Blockchain in Insurance, Interdisciplinary Research Grant of UManitoba, \$15,000.

External grants

- **MITACS 2022-2023:** Co-Investigator with Liquan Wang, Shaowei Wang, Carson Leung and Get-Greenline Inc. *Data Science for Business Analytics* (unused after approval due to research pivot), \$90,000.
- **Research Manitoba Health Council 2021-2023:** Principal Investigator with Carson Leung and Protegra Inc. *Bonafide: A Novel Protocol and Software Infrastructure for Improving Online Information Sharing and Control*. Innovation Proof-of-Concept 4413, \$150,000.
- **MITACS 2021-2022:** Principal Investigator with Carson Leung and Protegra Inc. *Bonafide: A Novel Protocol and Software Infrastructure for Improving Online Information Sharing and Control*. Mitacs Accelerate, \$90,000.
- **NSERC 2020-2025:** Principal Investigator. Data Science on Blockchains, NSERC discovery grant with an additional supplement for early researchers, DGEGR-2020-00302, \$135,000.
- ◊ **CANSSI 2021:** Co-Investigator With Dorcas Ofori-Boateng, Postdoctoral Research Full Fellowship from the Canadian Statistical Sciences Institute (2020-2021, unused due to tenure track appointment of Dr. Ofori-Boateng at the Portland State Univ.), \$80,000.

Publications (Asterisks denote a Ph.D. or MS. student)

H-Index: 21, I10-Index: 29. 1859 citations Source: Google Scholar.

Books

- ◊ **Blockchain: Fundamentals, Data Structures and Algorithms for Data Science**
C. G. Akcora, Y. R. Gel, M. Kantarcioglu
Course book for Data Science on Blockchains.
To be published by Cambridge University Press (2025).

Peer Reviewed Conference Papers

- ◊ **Gottack: Universal Adversarial Attacks on Graph Neural Networks via Graph Orbits Learning**
Z. Alom, T. G. B. Ngo, M. Kantarcioglu, C. G. Akcora
ICLR 2025, The Thirteenth International Conference on Learning Representations (2025).
- ◊ **Chainlet Orbits: Topological Address Embedding for the Bitcoin Blockchain**
P. Azad, B. Coskunuzer, M. Kantarcioglu, C. G. Akcora
KDD 2025, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (2025).

- ◇ **On the Impact of the Lightning Network on Bitcoin Transaction Fees and Network Value**
S. dos Santos, J. Singh, B. S. Dhillon, R. K. Thulasiram, C. Akcora, S. Kamali
IEEE International Conference on Blockchain (Blockchain), pp 148–156 (2024).
- ◇ **GraphPulse: Topological representations for temporal graph property prediction**
K. Shamsi, F. Poursafaei, S. Huang, Bao Tran Gia Ngo, B. Coskunuzer, C. G. Akcora
ICLR 2024, The Twelfth International Conference on Learning Representations pp 1–10 (2024).
- ◇ **Deep Learning-Based Credit Score Prediction: Hybrid LSTM-GRU Model.**
ASL, G.S., Shamsi, K., Thulasiram, R.K., Akcora, C. and Leung, C., IEEE Symposium Series on Computational Intelligence (SSCI) pp 395-400 (2023).
- ◇ **CALOSYS—A Robust Blockchain-based Marketing Loan Ecosystem for Small Businesses**
Shamsi, K., Khorasani, K.E., Rouhani, S. and Akcora, C.G., 2023, May.
IEEE International Conference on Blockchain and Cryptocurrency (ICBC) pp 1-3, (2023).
- ◇ **Smart Vectorizations for Single and Multiparameter Persistence**
B. Coskunuzer, C. G. Akcora, Z. Zhen, I. Dominguez, Y. R. Gel, M. Kantarcioglu
LoG 2023, Learning on Graphs Conference, pp 1–12.
- ◇ **Chartalist: Labeled Graph Datasets for UTXO and Account based blockchains**
*K. Shamsi, F. Victor, M. Kantarcioglu, Y. Gel, C.G. Akcora
Neurips 2022, Thirty-sixth Conference on Neural Information Processing Systems pp 1–10 (2022).
- ◇ **Reduction Algorithms for Persistence Diagrams of Networks: CoralTDA and PrunIT**
C. G. Akcora, B. Coskunuzer, Y. R. Gel, M. Kantarcioglu
Neurips 2022 (Spotlight article), Thirty-sixth Conference on Neural Information Processing Systems pp 1–10 (2022).
- ◇ **Topological anomaly detection in dynamic multilayer blockchain networks**
*D. Ofori-Boateng, I. Segovia Dominguez, C.G. Akcora, *Y. Li, Y. R. Gel, M. Kantarcioglu
ECML PKDD '21 The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases pp 1–12 (2021).
- ◇ **Alphacore: Data Depth based Core Decomposition**
*F. Victor, C. G. Akcora, Y. R. Gel, M. Kantarcioglu
KDD '21: The 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, online, pp 1–9 (2021).
- ◇ **BitcoinHeist: Topological Data Analysis for Ransomware Payment Detection on the Bitcoin Blockchain**
C. G. Akcora, *Y. Li, Y. R. Gel, M. Kantarcioglu
29th International Joint Conference on Artificial Intelligence (IJCAI-PRICAI 2020)
Tokyo, Japan, pp 1–7 (2020).
- ◇ **Ethereum Token Price Anomaly Prediction with Topological Depth Curves**
*Y. Li, *U. D. Islambekov, C. G. Akcora, E. Smirnova, Y. R. Gel, M. Kantarcioglu
SIAM International Conference on Data Mining (SDM) pp 1–9 (2020).
- ◇ **ChainNet: Learning on Blockchain Graphs with Topological Features**
*N. C. Abay, C. G. Akcora, *U. D. Islambekov, Y. R. Gel, M. Kantarcioglu, B. Thuraisingham
The 19th IEEE International Conference on Data Mining (ICDM)
Beijing, China, pp 1–10 (2019).
- ◇ **Attacklets: Modeling High Dimensionality in Real World Cyberattacks**
C. G. Akcora, J. Bakdash, Y. R. Gel, L. Marusich, M. Kantarcioglu, B. Thuraisingham
IEEE International Conference on Intelligence and Security Informatics (ISI) (34%)
Florida, Miami, USA pp 1–5 (2018).
- ◇ **Forecasting Bitcoin Price with Graph Chainlets**
C. G. Akcora, *A. K. Dey, Y. R. Gel, M. Kantarcioglu
The 22nd Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)
Melbourne, Australia, pp 1–12 (2018).

- ◇ **Temporal rules discovery for web data cleaning**
Z. Abedjan, C. G. Akcora, M. Ouzzani, P. Papotti, M. Stonebraker
The 42nd Very Large Data Bases Conference (VLDB)
New Delhi, India, pp 336—347 (2015).
- ◇ **Discovering trust patterns in ego networks**
C. G. Akcora, E. Ferrari
The 4th IEEE/ACM International Conference on Social Network Analysis and Mining (ASONAM)
Beijing, China, pp 224—229 (2014).
- ◇ **Multi-dimensional conversation analysis across online social networks**
*W. Lucia, C. G. Akcora, E. Ferrari
The 3rd IEEE International Conference on Social Computing and its Applications (SCSM)
Karlsruhe, Germany, pp 369—376 (2013).
- ◇ **Risks of friendships on social networks**
C. G. Akcora, B. Carminati, E. Ferrari
The 12th IEEE International Conference on Data Mining (ICDM)
Brussels, Belgium, pp 810—815 (2012).
- ◇ **Privacy in social networks, how risky is your social graph?**
C. G. Akcora, B. Carminati, E. Ferrari
The 28th IEEE International Conference on Data Engineering (ICDE)
Washington D.C, USA, pp 9—19 (2012).
- ◇ **Network and profile based measures for user similarities on social networks**
C. G. Akcora, B. Carminati, E. Ferrari
The 12th IEEE International Conference on Information Reuse and Integration (IRI)
Las Vegas, NV, USA, pp 292—298 (2011).
- ◇ **Building virtual communities on top of online social networks**
C. G. Akcora, B. Carminati, E. Ferrari
The 5th European Conference on Information Management and Evaluation (ECIME)
Como, Italy, pp 12—23 (2011).
- ◇ **Crowd-sourced sensing and collaboration using Twitter**
M. Demirbas, *M. A. Bayir, C. G. Akcora, *Y. S. Yilmaz, H. Ferhatosmanoglu
The 11th IEEE Int. Symp. on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)
Montreal, Canada, pp 1—9 (2010).

Journal Publications

- ◇ **A topological approach for capturing high-order interactions in graph data with applications to anomaly detection in time-varying cryptocurrency transaction graphs**
Umar Islambekov, Hasani Pathirana, Omid Khormali, Cüneyt Akçora, Ekaterina Smirnova.
Foundations of Data Science, pp 1–22 (2024). <https://doi.org/10.3934/fods.2024024>.
- ◇ **Bioelectronic Medicine: a multidisciplinary roadmap from biophysics to precision therapies**
M. A. Gonzalez-Gonzalez, S. V. Conde, R. Latorre, S. Thebault, M. Pratelli, N. C Spitzer, A. Verkhatsky, M. Tremblay, C. G. Akcora, A. G. Hernandez-Reynoso, M. Ecker, J. Coates, K. L. Vincent and B. Ma
Frontiers in Integrative Neuroscience, pp 1–38 (2024).
- ◇ **Network models of protein phosphorylation, acetylation, and ubiquitination connect metabolic and cell signaling pathways in lung cancer**
K. Ross, G Zhang, C. G. Akcora, Y. Lin, B. Fang, J. Koomen, E. Haura, M. Grimes
PLOS Computational Biology, pp 1–72 (2023).
- ◇ **Topological Forest**
M. A. Bayir, *K. Shamsi, C. G. Akcora
IEEE Access, pp 1–10 (2023).

- ◇ **Data Science for Blockchain**
C. G. Akcora, Y. R. Gel, M. Kantarcioglu
SIAM News, online at <https://sinews.siam.org/Details-Page/data-science-for-blockchain> (2022).
- ◇ **Blockchain Networks: Data Structures of Bitcoin, Monero, Zcash, Ethereum, Ripple and Iota**
C. G. Akcora, Y. R. Gel, M. Kantarcioglu
Wiley Wires Surveys in Computer Science, pp 1—39 (2021).
- ◇ **On the Role of Local Blockchain Network Features in Cryptocurrency Price Formation**
*A. K. Dey, C. G. Akcora, Y. R. Gel, M. Kantarcioglu
Canadian Journal of Statistics, pp 1—33 (2020).
- ◇ **GraphBoot: Quantifying Uncertainty in Node Feature Learning on Large Networks**
C. G. Akcora, Y. R. Gel, M. Kantarcioglu, V. Lyubchich, B. Thuraisingham, IEEE Transactions on Knowledge and Data Engineering, pp 1—16 (2019).
- ◇ **Blockchain Analytics for Intraday Financial Risk Modeling**
Matthew Dixon, C. G. Akcora, Yulia R. Gel, M. Kantarcioglu, Springer’s Digital Finance, pp 1—25 (2019).
- ◇ **Invited paper: Blockchain Data Analytics**
C. G. Akcora, Matthew Dixon, Yulia R. Gel, M. Kantarcioglu, IEEE Bulletin of Intelligent Informatics, pp 1—8 (2018).
- ◇ **Bitcoin Risk Modeling with Blockchain Graphs**
C. G. Akcora, Matthew Dixon, Yulia R. Gel, M. Kantarcioglu, Economics Letters, pp 1—5 (2018).
- ◇ **Blockchain: A graph primer (2017 Edition)**
C. G. Akcora, Y. R. Gel, M. Kantarcioglu
arXiv:1708.08749, pp 1—16 (2017).
- ◇ **Detecting anomalies in social network data consumption**
C. G. Akcora, B. Carminati, E. Ferrari, M. Kantarcioglu
Springer Social Network Analysis and Mining, Vol. 4, pp 231—245 (2014).
- ◇ **User similarities on social networks**
C. G. Akcora, B. Carminati, E. Ferrari
Springer Social Network Analysis and Mining, Vol. 3, pp 475—495 (2013).
- ◇ **Trend sensing via Twitter**
Y. S. Yilmaz, *M. F. Bulut, C. G. Akcora, *M. A. Bayir, M. Demirbas
Inderscience Ad Hoc and Ubiquitous Computing, Vol. 14, 16—26 (2013).

Workshops

- ◇ **Are Existing Large Language Models Robust Against Jailbreak Attacks?**
B. Rababah, S. T. Wu, M. Kwiatkowski, C. K. Leung, C. G. Akcora
IEEE International Conference on Big Data (BigData), pp 5383–5391 (2024).
- ◇ **SOK: Prompt Hacking of Large Language Models**
B. Rababah, S. T. Wu, M. Kwiatkowski, C. K. Leung, C. G. Akcora
IEEE International Conference on Big Data (BigData), pp 5392–5401 (2024).
- ◇ **Identifying breakpoints in public opinion**
C. G. Akcora, *M. A. Bayir, M. Demirbas, H. Ferhatosmanoglu
The 1st Workshop on Social Media Analytics (KDD’10 SOMA)
Washington D.C, USA, pp 62—66 (2010).

Panels

◇ **Coinbase Machine Learning and Blockchain Summit**

C. G. Akcora, Rajarshi Gupta (ML head at Coinbase), Bhaskar Krishnamachari (University of Southern California), Mohammad Sadoghi (UC Davis), Lori Vergara (PalmNFT)
Online, (2023).

◇ **AI for Security and Security for AI**

C. G. Akcora, E Bertino, M Kantarcioglu (UT Dallas), S Samtani (Indiana University), S Mittal (University of North Carolina), M Gupta (Maanak Gupta)
ACM Conference on Data and Application Security and Privacy (CodaSPY)
Dallas, Texas, (2019).

Book Chapters

◇ **Using Deep Learning to Generate Relational HoneyData**

N. C. Abay, C. G. Akcora, Y. Zhou, M. Kantarcioglu, B. Thuraisingham
Springer, Automated Cyber Deception, pp 1—16 (2019).

Encyclopedia Entries

◇ **User Similarities on Social Networks**

C. G. Akcora, E. Ferrari
Springer Encyclopedia of Social Network Analysis and Mining (ESNAM), pp 1734—1743 (2014).

◇ **Graphical User Interfaces for Privacy Settings**

C. G. Akcora, E. Ferrari
Springer Encyclopedia of Social Network Analysis and Mining (ESNAM), pp 1—8 (2014).

Translation

◇ English-Turkish, **Fundamentals of Information Systems Security**

David Kim and Michael G. Solomon, ISBN: 978-605-033-000-7
Chapter 3: Malicious Attacks, Threats, and Vulnerabilities, pp 70—110
Publisher: NOBEL Akademik Yayıncılık, Edited by Ozgu Can (2019).

Other Publications

◇ **Machine Learning for Blockchain Data Analysis: Progress and Opportunities**

P. Azad, C. G. Akcora, A. Khan
arXiv preprint arXiv:2404.18251 (2024).

◇ **Explaining the Power of Topological Data Analysis in Graph Machine Learning**

F. M. Taiwo, U. Islambekov, C. G. Akcora
arXiv preprint arXiv:2401.04250 (2024).

◇ **Towards Neural Scaling Laws for Foundation Models on Temporal Graphs**

R. Shirzadkhani, T. G. B. Ngo, K. Shamsi, S. Huang, F. Poursafaei, P. Azad, ...
arXiv preprint arXiv:2406.10426 (2024).

◇ **Wise-GNN: Enhancing GNNs with Wise Embeddings**

M. J. Uddin, A. Tola, C. G. Akcora, B. Coskunuzer
Arxiv Preprint, (2024).

◇ **ClassContrast: Bridging the Spatial and Contextual Gaps for Node Representations**

M. J. Uddin, A. Tola, V. Sikand, C. G. Akcora, B. Coskunuzer
arXiv preprint arXiv:2410.02158 (2024).

◇ **TopER: Topological Embeddings in Graph Representation Learning**

A. Tola, F. M. Taiwo, C. G. Akcora, B. Coskunuzer
arXiv preprint arXiv:2410.01778 (2024).

◇ **Topological Methods in Machine Learning: A Tutorial for Practitioners**

B. Coskunuzer, C. G. Akcora
arXiv preprint arXiv:2409.02901 (2024).

◇ **How to Not Get Caught When You Launder Money on Blockchain**

C. G. Akcora, Y. R. Gel, M. Kantarcioglu,

Editorial requests would make the article unrecognizable, hence we do not consider a re-submission.

Editor's rejection note: *Thanks for the resubmission, but I am still not finding that this paper is appropriate for XXX. Frankly, I was expecting a much more significant revision to The amount of material about how to launder money without getting caught is too much for a XXX paper.*

<https://arxiv.org/pdf/2010.15082.pdf>, pp 1—7.

◇ **Twitter: Roots, Influence and Applications**

C. G. Akcora, M. Demirbas

Technical Report, Department of Computer Science and Engineering

University at Buffalo, NY, pp 1—24 (2010).

Public Media

Radio Interviews

- ◇ **CBC Radio One - Canada.** *Risks and the Future of AI, July 2023.*

Podcasts

- ◇ **Tech Detonator Show - Canada.** Government, Humans, CHATGPT models & Careers with Artificial Intelligence, May 2023.

Presentations

Conference Tutorials

- ◇ **Graph-based Management and Mining of Blockchain Data.** *CIKM '22: Proceedings of the 31st ACM International Conference on Information and Knowledge Management, Atlanta, Georgia, USA (October 2022).*
- ◇ **Data Science on Blockchains.** *KDD '21: Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery & Data Mining, online, (2021).*
- ◇ **Blockchain Graph Models and Blockchain Data Analytics.** *DMS Blockchain Workshop organized by the United States National Science Foundation (sites.google.com/view/nsf-blockchain-workshop), (June 16, 2021).*
- ◇ **Data Science on Blockchains**, with Yulia R. Gel and Murat Kantarcioglu. *SIAM International Conference on Data Mining (SDM), (May 7 - 9, 2021).*
- ◇ *[Online due to Covid-19]* **Data Science on Blockchains**, with Yulia R. Gel and Murat Kantarcioglu. *The IEEE Conference on Data Engineering (ICDE), Dallas, U.S., (April 20-24, 2020).*
- ◇ **Blockchain Data Analytics**, with Yulia R. Gel and Murat Kantarcioglu. *The Pacific-Asia Conference on Knowledge Discovery and Data Mining (PaKDD), Macau, China, (Spring 2019).*
- ◇ **Blockchain Data Analytics**, with Yulia R. Gel and Murat Kantarcioglu. *The IEEE International Conference on Data Mining (ICDM), Singapore, (17 November 2018).*

Invited Courses

- ◇ **Applications of topology in online social networks and Blockchain networks**, Instituto de Matemáticas de la Universidad de Sevilla, Spain, (May 22-26, 2023).
- ◇ **Blockchain Data Analytics**, School of Statistics, University of Minnesota, Minneapolis, Minnesota, USA (November 2018).

Invited Talks

- ◇ **Topological Aspects and Neural Scaling Laws for Temporal Graph Foundation Models**, Department of Statistics, University of Maryland at Baltimore, Orlando, Florida. (November 2024).
- ◇ **Topological Aspects and Neural Scaling Laws for Temporal Graph Foundation Models**, Department of Statistics, University of Central Florida, Orlando, Florida. (October 2024).

- ◇ **Leveraging Machine Learning on Blockchain Graphs for Next-Generation Solutions**, the Florida Institute of Certified Public Accountants, online. (October 2024).
- ◇ **Bureau Language Model**, presented by Kiarash Shamsi, Equifax Research Labs, online. (August 2024).
- ◇ **Adversarial Graph Machine Learning on Blockchain**, AI Institute, University of Central Florida. (March 2024).
- ◇ **AI and the role of UCF in the upcoming AI age**, Seminole State College, Florida, (November 2023).
- ◇ **Adversarial Graph Machine Learning on Blockchains**, Coinbase Machine Learning and Blockchain Research Summit <https://www.coinbase.com/ml-bc-summit>, online, (May 2023).
- ◇ **Topological Graph Machine Learning on Blockchains**, University of Central Florida, online, (May 2023).
- ◇ **Topological Graph Machine Learning on Blockchains**, University of Northern Illinois, online, (April 2023).
- ◇ **Money Laundering on Blockchain: Measures and Countermeasures**, Bits and Blocks (Blockchain) Workshop <https://bitsandblocks2021.super.site/>, online, (December 2021).
- ◇ **Topological Data Analysis for Ransomware Detection on the Bitcoin Blockchain**, Digital Forensics research conference (<https://dfrws.org/conferences/dfrws-usa-2021/>), online, (July 2021).
- ◇ **E-crime detection on Blockchains**, New York University, Center for Data Science, online (March 2021).
- ◇ **Topological Data Analysis for Ransomware Detection on the Bitcoin Blockchain**, Data Science Nexus Invited Talk, online, Canada (December 2020).
- ◇ **Topological Data Analysis for Ransomware Detection on the Bitcoin Blockchain**, The Smart Cybersecurity Network (Serene-Risc) Annual Workshop, online, Canada (October 2020).
- ◇ **Topological Data Analysis on Networks – Applications and Scalability issues**, University of Montana, Department of Mathematical Science, USA (September 2020).
- ◇ **Topological Data Analysis on Networks – Applications and Scalability issues**, Virginia Commonwealth University, Department of Biostatistics, USA (September 2020).
- ◇ **Data Science on Blockchains**, Joint Statistical Meetings, online (August 2020).
- ◇ **Explainable Artificial Intelligence**, Sightline Innovation Inc., Winnipeg, Manitoba, Canada (February 2020).
- ◇ **Learning on Blockchain Graphs with Topological Features**, SAMSI Workshop on Foundations of Blockchain Data Analytics, Durham, NC, USA (October 2019).
- ◇ **Blockchain Data Analytics: A New Frontier in Data Science**, The 36th Annual Quality and Productivity Research Conference, Washington D.C., USA (June 2019).
- ◇ **Multi-Layer Analysis of Biological Networks**, International Chinese Statistical Association, the ICSA China Conference, Tianjin, China (July 2019).
- ◇ **Blockchain Data Privacy and Security**, Annual Computer Security Applications Conference (AC-SAC), Puerto Rico (December 2018).
- ◇ **Understanding Cryptocurrency Price Formation from Time Series of Local Blockchain Graph Features**, the Joint Statistical Meetings (JSM), Vancouver, Canada (August 2018).
- ◇ **A Time Series Approach in Blockchain Data Analytics**, Michigan State Symposium on Mathematical Statistics and Applications in Honor of Hira L. Koul's Scientific Legacy, East Lansing, Michigan, USA (September 2018).

Guest lectures

- ◇ Explainability and Ethics in Artificial Intelligence, UW Tacoma, August 2021.

- ◇ Explainable AI, COMP 7950, Advanced Machine Learning, University of Manitoba. April 2021.
- ◇ Ransomware Detection in Cryptocurrencies, TCSL 550: Network and Internet Security, University of Washington Tacoma, Computer Science, WA, USA. May 2020.
- ◇ A Holistic View of the Blockchain Ecosystem, UT Dallas, School of Management, Dallas, Texas, USA. April 2020.

Seminars

- ◇ **Topological Data Analysis for Blockchain Networks**, Applied Algebraic Topology Group, University of Minnesota. October 2020.
- ◇ **Blockchain Data Analytics**, Operations Research, City University of Hong Kong, China. November 2018.
- ◇ Rochester Institute of Technology, Statistics, Rochester, NY, USA. May 2018.
- ◇ University of Texas at Dallas, Computer Science, Dallas, Texas, USA. April 2018.
- ◇ Southern Methodist University, Statistics, Dallas, Texas, USA. March 2018.
- ◇ Instituto Tecnológico Autónomo de México, Computer Science, Mexico City, Mexico. October 2017.
- ◇ Ege University, Computer Science, Izmir, Turkey. August 2016.
- ◇ Marmara University, Computer Science, Istanbul, Turkey. June 2016.
- ◇ Bogazici University, Computer Science, Istanbul, Turkey. May 2016.

Faculty Service

- ◇ **AI Initiative Faculty Search Committee** University of Central Florida (2024).
- ◇ **Finance Faculty Search Committee** University of Central Florida (2024, 2025).
- ◇ The School of Medicine, CRC Tier 2 in Artificial Intelligence: First Search Committee University of Manitoba (2022).
- ◇ **UMGF Awards Committee** University of Manitoba (2022).
- ◇ **Neuroscience Department Council** University of Manitoba (2021).
- ◇ **Nexus Data Science Conference Organizing Committee** University of Manitoba (2021).
- ◇ **FoS 2021: Faculty consultant in AI and Machine Learning Solutions** program of UManitoba.
- ◇ **Graduate Awards Committee** University of Manitoba (2020).
- ◇ **Indigenous Faculty Search Committee** University of Manitoba (2021).
- ◇ **Graduate Student Admissions Committee** University of Manitoba (2021)

Professional Service

Panel Reviewer

- ◇ NSF-NIH Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science.

Chair Roles

- ◇ **Co-chair for** The Fourth IEEE International Conference on Blockchain Computing and Applications (BCCA'2022).
- ◇ **Demo chair for** IEEE International Conference on Data Engineering (ICDE 2020).
- ◇ **Track chair for** IEEE International Conference on Cyberspace Data and Intelligence (Cyber DI 2019).

Editing

- ◇ **Guest Editor** to the special issue on *Advances on Blockchains and Applications* for the *Turkish Journal of Electrical Engineering & Computer Sciences*. Co-editors: Assoc. Prof. Alptekin Küpçü, Koç University, Turkey; Assoc. Prof. Anwitaman Datta, Nanyang Technological University, Singapore. 2022.
- ◇ **Associate editor for**
 - Frontiers in Physics, Social Physics
- ◇ **Co-editor for**
 - the special issue of Big Data and Cognitive Computing: Blockchain Data Analytics and Graph Mining.
- ◇ **Review editor** to the Editorial Board of Cybersecurity and Privacy for Frontiers in Big Data.

Review Duties

- ◇ **Referee for**
 - *Nature Scientific Reports*.
 - **IEEE** *Internet Computing, Communications Magazine*
 - **IEEE Transactions on** *Emerging Topics in Computing, Systems, Man and Cybernetics, Industrial Electronics, Mobile Computing, Services Computing, Dependable and Secure Computing, Industrial Informatics*
 - **Elsevier** *Journals of Online Social Networks and Media, Digital Communications and Networks, Computational Statistics and Data Analysis (CSDA)*
 - **Springer** *Journals of Classification, Financial Innovation, Grid Computing, Social Network Analysis and Mining, Data Science and Engineering*
 - *The Information Security (IET-IS)*
 - *PeerJ Computer Science*
 - *EPJ Data Science*
 - *The VLDB Journal*
 - *ACM Computing Surveys, Transactions on Data Science*
 - *Canadian Journal of Statistics*
 - *MDPI Sensors*
 - *Journal of King Saud University - Computer and Information Sciences*
 - **Oxford Academic** *Journal of Complex Networks*
 - **Wiley** *Expert Systems*
 - *Jordanian Journal of Computers and Information Technology*
- ◇ **Conference reviewer for** *IJCAI2025, KDD2025, NeurIPS2025, ICML2025, AISTATS2025, ICLR2025, SRDS2024, IJCAI2024, NeurIPS2024, ICML2024, KDD2024, ECML/PKDD2024, AAAI2024, NeurIPS2023, IEEE ICDM BDA2023, DeFi2023, CAAW2023, DeFi2024, ICB2023, UYMS2022, BTS2022, CAAW2022, IEEE CIFE2022, IFCA Workshop on Decentralized Finance 2022, MIDAS2021, Cyber2021, CC-CIS2021, CODASPY2022, IFCA Workshop on Decentralized Finance 2021, AAAI2021, CODASPY2021, ECML/PKDD2021, ICLR2022, ICML2022, NeurIPS2022, ECML/PKDD2020, CODASPY2020, CyberDI2020, UYMS2020, NSysS2020, IEEE SSCI2020, ICLR2022, ICML2021, ASEAN-AI2018, VLDB2018, KDD2018, PaKDD2018, KDD2017, SDM2017, SIGMOD2017, ICDE2014, ASONAM2014, ICWSM2014, ICDM2013, SCA2013, CODASPY2012, IRI2011, WWW2011.*
- ◇ **PC this year** *IJCAI25*
- ◇ **Proposal reviewer for** *NSF, NSERC Discovery, Mitacs Accelerate, Canada.*

Organization of Technical Meetings

- ◇ Organizer, Session on **Blockchain Networks**, Networks 2021: A Joint Sunbelt and NetSci Conference, Washington D.C. (July 6-11, 2021).
- ◇ Organizer, Workshop on **AI and Blockchains**, IJCAI-PRICAI, Tokyo, Japan (2020).
- ◇ Organizer, Workshop on **Blockchain Data Analytics**, Canadian Statistical Sciences Institute, BIRS, Alberta (March 2020).
- ◇ Organizer, Workshop on **Blockchain Data Analytics**, 19th International Conference on Data Mining (IEEE ICDM), Beijing, China (2019).
- ◇ Organizer, Workshop on **Foundations of Blockchain Data Analytics**, The Statistical and Applied Mathematical Sciences Institute (SAMSI), North Carolina, U.S. (2019).
- ◇ Chair, Session on **Behavioral Data Mining**, The 23rd Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), Macau, China (2019).
- ◇ Organizer, Session on **Future of Blockchain from a Big Data Perspective**, 4th International Conference on Big Data and Information Analytics (BigDia), Houston, USA (2018).

Panel Talks

- ◇ *Panelist, **AI for Security and Security for AI**, The 11th ACM conference on Data and Application Security and Privacy (CODASPY), Dallas, USA (2021).*
- ◇ *Panelist, **Blockchain Security and Privacy**, The 9th ACM conference on Data and Application Security and Privacy (CODASPY), Dallas, USA (2019).*
Online event video, starting at 6:30:30

Ph.D. Thesis Committee

- ◇ Ahod Tareq Alghuried, Advisor: David Mohaisen. Computer Science, University of Central Florida (2024-).
- ◇ Ashani Wickramasinghe, Advisor: Saman Muthukumarana. Statistics, **Advanced Data-Driven Methods for IOT Sensor Data and Anomaly Analysis in Building Environments**, University of Central Florida (2020-2024).
- ◇ Saulo Quinteiro dos Santos, Advisors: Ruppa K. Thulasiram and Shahin Kamali, **Improving Protocols and Miner Strategies for Modern Cryptocurrencies**, University of Manitoba (2019-2024).
- ◇ Le An Lac, Advisors: Carson Leung and Pingzhao Hu, University of Manitoba (2021-2025).
- ◇ Yan Sun, Advisors: Carson Leung and Pingzhao Hu, University of Manitoba (2021-2025).
- ◇ Engin Deniz Tumer, Advisor: Elena Ferrari, **Access control within MQTT-based IoT Environments**, Dipartimento di Scienze Teoriche e Applicate, Università degli studi dell'Insubria, Italy (2018-2022).

Ms. Thesis Committee

- ◇ *Ashish Lakhmani, **Nature Inspired Algorithmic Strategies for Portfolio Optimization**, Master of Science, Department of Computer Science, University of Manitoba (2024).*
- ◇ *Hamid Hadipour, **Deep Learning-Enhanced Drug Discovery: Innovative Molecule Clustering and Interaction Prediction through Graph Analysis**, Master of Science, Department of Computer Science, University of Manitoba (2023).*
- ◇ *Andrew Kozar, **Data Collection Using Deep Reinforcement Learning for Serious Games**, Master of Science, Department of Electrical and Computer Engineering, University of Manitoba (2023).*
- ◇ *Japjeet Singh, **Data-Driven Risk Forecasting and Algorithmic Trading Models for Cryptocurrencies**, Master of Science, Department of Computer Science, University of Manitoba (2022).*
- ◇ *Kyle Leduc-McNiven, **Serious Game Development for Detecting Mild Cognitive Impairment**, Master of Science, Department of Electrical and Computer Engineering, University of Manitoba (2022).*

- ◇ Qi Wen, *Personalized Privacy-Preserving Recommendation System*, Master of Science, Department of Computer Science, University of Manitoba (2022).
- ◇ Ashani Nuwanthika Wickramasinghe, *Community Detection in Social Networks with an Application to Covid-19 Data*, Master of Science, Department of Statistics, University of Manitoba (2021).
- ◇ Kushagra Sharma, *Deep Learning-Based ECG Classification Using a Tensorflow Lite Model*, Master of Science, Department of Computer Science, University of Manitoba (2020).

Committee Chair

- ◇ Michael Guevarra, M.Sc. thesis defense, **Reinforcement Learning Agents Providing Real-time Formative Feedback to Users in Training Simulations**, Department of Electrical and Computer Engineering, University of Manitoba (2023).
- ◇ Alexa Minary, M.Sc. thesis defense, **Mice can Monitor Their Timing Errors**, Department of Biological Sciences, University of Manitoba (2023).
- ◇ Le An Lac, M.Sc. thesis defense, **Pretest and Stein-type Shrinkage Estimators in Linear and Generalized Partial Linear Models**, University of Manitoba (2021).
- ◇ Samuel Morrissette, M.Sc. thesis defense, **Assessing Behaviour of Casino Patrons Using Clustering Methods**, University of Manitoba (2021).
- ◇ Adriana-Stefania Ciupeanu, candidacy exam for **Ph.D. in Mathematics IIS**, University of Manitoba (2021).

Teaching

- ◇ CAP 5619, AI for Finance, Spring 2024.
FinTech Ms. students (40+ students).
Finance, University of Central Florida.
- ◇ CIS 5730, Blockchain and Smart Contracts, Summer 2024.
FinTech Ms. students (40+ students).
Finance, University of Central Florida.
- ◇ Topological Data Analysis in Networks, University of Seville
Three day, online course Python Tutorial. Course videos: part 1 and part 2
- ◇ Data Science on Blockchains, Udemy MOOC course
Online at <https://www.udemy.com/course/data-science-on-blockchains/>.
- ◇ COMP 4190, Advanced Artificial Intelligence, Winter 2021.
Core course for undergraduate students (40+ students).
Computer Science, University of Manitoba.
- ◇ COMP 2140, Data Structures and Algorithms, Winter 2020, Winter 2021.
Core course for undergraduate students (90+ students).
Computer Science, University of Manitoba.
- ◇ COMP 7570, Blockchain Data Analytics, Fall 2019, Fall 2020, Fall 2021.
Elective course for graduate students (25 students).
Computer Science, University of Manitoba.
- ◇ CS 6313, Statistical Methods for Data Science, Fall 2018, Spring 2019.
Core course for Data Science specialization (+150 students).
Computer Science and Engineering, University of Texas at Dallas.
- ◇ Data Analysis with R, Spring 2013.
Master's level course (13 students).
Computer Science, Università degli Studi dell'Insubria.

- ◇ Privacy and Security of Data, Spring 2012.
Master's level course (11 students).
Computer Science, Università degli Studi dell'Insubria.

Data Repositories

- ◇ Chartalist: Labeled Graph Datasets for UTXO and Account based blockchains
<http://chartalist.org>

Public Datasets

- ◇ Stanford SNAP: Ethereum Exchanges - AlphaCore Dataset
<https://snap.stanford.edu/data/ethereum-exchanges.html>
- ◇ Stanford SNAP: Stablecoin ERC20 Transactions Dataset
<https://snap.stanford.edu/data/ERC20-stablecoins.html>
- ◇ Stanford TGBL-Coin: Dynamic Link Property Prediction Dataset
<https://tgb.complexdatalab.com/docs/linkprop/#tgb1-coin>
- ◇ BitcoinHeist Ransomware: Ransomware address features on the Bitcoin Blockchain
<http://archive.ics.uci.edu/ml/datasets/BitcoinHeistRansomwareAddressDataset>
<https://www.kaggle.com/sapere0/bitcoinheist-ransomware-dataset>
<https://www.openml.org/d/42553>
- ◇ Bitcoin Transaction Dataset: Bitcoin heterogeneous network data from 2009-2017 (<https://www.kaggle.com/sapere0/bitcoin-dataset>).

Software Packages

- ◇ Github/GraphBoot: A Bootstrapped Sampling framework in Scala/Apache Spark.
- ◇ Github/Coinworks: Bitcoin Chain Analysis platform in R/Java/Scala.

Computer Skills

- ◇ Languages: Scala, Java, R, PHP, SQL, Python, JavaScript, L^AT_EX.
- ◇ OS/Tools/Libraries: PyTorch Geometric, OpenMPI, Twitter4J, jQuery, Jung.
- ◇ Open Source Projects: Apache Storm, Apache Spark.

Language Skills

- ◇ Turkish: Native.
- ◇ English: Advanced.
- ◇ Italian: Upper-intermediate.
- ◇ Chinese: 汉语水平考试四 (HSK 4).