Behnam Bahrak

Tehran, Iran
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Research Interests

Applied Machine Learning, Network Science, Decentralized Finance.

Education

Ph.D. Electrical and Computer Engineering   January 2009 - December 2013
Virginia Tech, Blacksburg, VA, USA
- Ph.D. research in cognitive radio network security under direction of Prof. Jung-Min Park. Dissertation title: Ex Ante Approaches for Security, Privacy, and Enforcement in Spectrum Sharing.

M.Sc. Electrical Engineering   September 2006 - August 2008
Sharif University of Technology, Tehran, Iran
- Focus areas: cryptography (Thesis title: Impossible Differential Cryptanalysis of Block Ciphers).

B.Sc. Electrical Engineering   September 2002 - September 2006
Sharif University of Technology, Tehran, Iran

Professional Experience

Assistant Professor   May 2023 - Present
Tehran Institute for Advanced Studies, Tehran, Iran

Assistant Professor   January 2015 - December 2022
University of Tehran, Tehran, Iran

Director   February 2018 - December 2022
Data Analytics Lab, University of Tehran, Tehran, Iran

Research Assistant   January 2009 - December 2013
Laboratory of Advanced Research in Information Assurance and Security (ARIAS), Virginia Tech, Blacksburg, VA, USA

Research Assistant   September 2006 - September 2008
Information Systems and Security Laboratory (ISSL), Sharif University of Technology, Tehran, Iran

Teaching Experience

- *Algorithmic Graph Theory*   *2015-2021*
- *Probability and Statistics for Computer Scientists*   *2015-2022*
- *Statistical Inference*   *2016-2022*
- *Introduction to Blockchain and Digital Currencies*   *2017-2021*
- *Data Analytics and Visualization*   *2020*
- *Introduction to Network Security*   *2016-2019*
- *Wireless Communication*   *2017*
- *Advanced Graph Theory*   *2016-2018*
- *Applied Machine Learning*   *2023*
- *Data Visualization*   *2023*

Publications   See also my google scholar page.

Peer-Reviewed Journal Articles:

33. G. Kalhor, B. Bahrak, *Understanding trends, patterns, and dynamics in global company acquisitions: a network perspective*, EPJ Data Science, 2024.

32. P. Golshanrad, H. Mahini, B. Bahrak, *Proposing a model for predicting passenger origin–destination in online taxi-hailing systems*, Public Transport, 2024.

31. Z. Naderi, S.P. Shariatpanahi, B. Bahrak, *A novel approach to alleviate wealth compounding in proof-of-stake cryptocurrencies*, Peer-to-Peer Networking and Applications, 2024.

30. G. Kalhor, T. Zeraati, B. Bahrak, *Diversity dilemmas: uncovering gender and nationality biases in graduate admissions across top North American computer science programs*, EPJ Data Science, 2023.

29. T. ShabaniMirzaei, H. Chamani, A. Abaskohi, Z. Sourati, B Bahrak, *A large-scale analysis of Persian Tweets regarding Covid-19 vaccination*, Social Network Analysis and Mining 13 (1), 2023.

28. M. S. Mahdizadeh, B. Bahrak, M. Sayad Haghighi *Decentralizing the lightning network: a score-based recommendation strategy for the autopilot system*, Applied Network Science 8 (1), 2023.

27. A. Shojaeinasab, A.P. Motamed, B. Bahrak, *Mixing detection on bitcoin transactions using statistical patterns*, IET Blockchain 3 (3), 2023.

26. S. Alizadeh, A. Setayesh, A. Mohamadpour, B. Bahrak, *A network analysis of the non-fungible token (NFT) market: structural characteristics, evolution, and interactions*, Applied Network Science 8 (1), 2023.

25. A. Setayesh, Z. Sourati Hassan Zadeh, B. Bahrak, *Analysis of the global trade network using exponential random graph models*, Applied Network Science 7 (1), 2022.

24. G. Kalhor, A. Asadi Sarijalou, N. Sharifi Sadr, B. Bahrak, *A new insight to the analysis of co-authorship in Google Scholar*, Applied Network Science 7 (1), 2022.

23. Z. Sourati Hassan Zadeh, N. Sabri, H. Chamani, B. Bahrak, *Quantitative analysis of fanfictions' popularity*, Social Network Analysis and Mining 12 (1), 2022.

22. A. Mokhtari, N. Ghorbani, B. Bahrak, *Aggregated traffic anomaly detection using time series forecasting on call detail records*, Security and Communication Networks, 2022.

21. F. Ghaffari, B. Bahrak, S.P. Shariatpanahi, *A novel approach to partial coverage in wireless sensor networks via the roman dominating set*, IET Networks 11 (2), 2022.

20. F. Ghaffari, S.P. Shariatpanahi, M.J. Siavoshani, B. Bahrak, *Multi-sender index coding over linear networks*, IEEE Communications Letters, 2021.

19. A. Keramatipour, B. Bahrak, *Zombie number of the Cartesian product of graphs*, Discrete Applied Mathematics 289, 2021.

18. M.S. Mahdizadeh, B. Bahrak, *A regression framework for predicting user's next location using call detail records*, Computer Networks 183, 2020.

17. N. Sabri, S. Sadeghian, B. Bahrak, *A cross-country study on cultural similarities based on book preferences*, Social Network Analysis and Mining 10 (1), 2020.

16. A. Nejadettehad, H. Mahini, B. Bahrak, *Short-term demand forecasting for online car-hailing services using recurrent neural networks*, Applied Artificial Intelligence 34 (9), 2020.

15. H. Safari, N. Sabri, F. Shahsavan, B. Bahrak, *Structural Analysis of GitLab's Users and Projects Networks*, International Journal of Information and Communication Technology Research 12 (2), 2020.

14. M.H. Ansari, V. Tabatab Vakili, B. Bahrak, *Evaluation of big data frameworks for analysis of smart grids*, Journal of Big Data 6 (1), 2019.

13. A.P. Motamed, B. Bahrak, *Quantitative analysis of cryptocurrencies transaction graph*, Applied Network Science 4 (1), 2019.

12. M.A. Nia, B. Bahrak, M. Kargahi, B. Fabian, *Detecting new generations of threats using attribute-based attack graphs*, IET Information Security 13 (4), 2019.

11. M.H. Ansari, V.T. Vakili, B. Bahrak, P. Tavassoli, *Graph theoretical defense mechanisms against false data injection attacks in smart grids*, Journal of Modern Power Systems and Clean Energy 6 (5), 2018.

10. H. Jannati, E. Ardeshir-Larijani, B. Bahrak, *Privacy in cross-user data deduplication*, Mobile Networks and Applications, 2018.

9. H. Jannati, B. Bahrak, *An improved authentication protocol for distributed mobile cloud computing services*, International Journal of Critical Infrastructure Protection 19, 2017.

8. H. Jannati, B. Bahrak, *An oblivious transfer protocol based on elgamal encryption for preserving location privacy*, Wireless Personal Communications 97 (2), 2017.

7. H. Jannati, B. Bahrak, *Security analysis of an RFID tag search protocol*, Information Processing Letters 116 (10), 2016.

6. M.M. Tajiki, M.A. Akhaee, B. Bahrak, *Improved secure searchable asymmetric encryption for cloud storage services*, Computing and Security 2 (3), 2015.

5. J.M. Park, J.H. Reed, A.A. Beex, T.C. Clancy, V. Kumar, B. Bahrak, *Security and enforcement in spectrum sharing*, Proceedings of the IEEE 102 (3), 2014.

4. B. Bahrak, J.M. Park, *Coexistence decision making for spectrum sharing among heterogeneous wireless systems*, IEEE Transactions on Wireless Communications 13 (3), 2014.

3. B. Bahrak, J.M. Park, *Security of spectrum learning in cognitive radios*, SKTelecom Telecommunications Review 22 (6), 2012.

2. B. Bahrak, A. Deshpande, J.M. Park, *Spectrum access policy reasoning for policy-based cognitive radios*, Computer Networks 56 (11), 2012.

1. B. Bahrak, M.R. Aref, *Impossible differential attack on seven-round AES-128*, IET Information Security 2 (2), 2008.

Conference Proceedings:

23. G. Kalhor, B. Bahrak, *Predicting Users' Demographic Features Based on Searched Queries and Installed Apps and Games*, International Computer Conference, Computer Society of Iran (CSICC), 2023.

22. A. Rayegan, A. Shiri, B. Bahrak, *A comparative study of machine learning techniques for stock price prediction*, Iranian Conference on Signal Processing and Intelligent Systems (ICSPIS), 2022.

21. A. Armin, A. Shiri, B. Bahrak, *Comparison of Machine Learning Methods for Cryptocurrency Price Prediction*, Iranian Conference on Signal Processing and Intelligent Systems (ICSPIS), 2022.

20. A. Karimi Mamaghan, A. Setayesh, B. Bahrak, *Analysis of Address Lifespans in Bitcoin and Ethereum*, International Conference on Computer Engineering and Knowledge (ICCKE), 2022.

19. P. Taheri Makhsoos, B. Bahrak, F. Taghiyareh, *Designing a High Performance and High-Profit P2P Energy Trading System Using a Consortium Blockchain Network*, International Conference on Computer Engineering and Knowledge (ICCKE), 2022.

18. A. Edalat, Y. Yaghoobzadeh, B. Bahrak, *AliEdalat at SemEval-2022 Task 4: Patronizing and Condescending Language Detection using Fine-tuned Language Models, BERT+BiGRU, and Ensemble Models*, International Workshop on Semantic Evaluation (SemEval), 2022.

17. A. Abbaskohi, A. Rasouli, T. Zeraati, B. Bahrak, *UTNLP at SemEval-2022 Task 6: A Comparative Analysis of Sarcasm Detection using Generative-based and Mutation-based Data Augmentation*, International Workshop on Semantic Evaluation (SemEval), 2022.

16. N. Sabri, M.M. Mahdizadeh, R. Akhavan, B. Bahrak, *Exploring the Similarities of Iranian Influencers with Regards to Content, Relationships and Interactions with Users*, International Computer Conference, Computer Society of Iran (CS-ICC), 2022.

15. D. Golnarian, K. Saedi, B. Bahrak, *A Decentralized and Trustless E-voting System Based on Blockchain Technology*, International Computer Conference, Computer Society of Iran (CSICC), 2022.

14. K. Bakhshi, B. Bahrak, H. Mahini, *Fraud Detection System in Online Ride-Hailing Services*, International Conference on Signal Processing and Intelligent Systems (ICSPIS), 2021.

13. H. Chamani, Z. Sourati Hassan Zadeh, B. Bahrak, *An Overview of Regression Methods in Early Prediction of Movie Ratings*, International Conference on Computer Engineering and Knowledge (ICCKE), 2021.

12. Z. Motaqy, G. Almashaqbeh, B. Bahrak, N. Yazdani, *Bet and Attack: Incentive Compatible Collaborative Attacks using Smart Contracts*, International Conference on Decision and Game Theory for Security, 2021.

11. N. Sabri, R. Akhavan, B. Bahrak, *EmoPars: A Collection of 30K Emotion-Annotated Persian Social Media Texts*, Student Research Workshop Associated with RANLP, 2021.

10. A. Salemi, N. Sabri, E. Kebriaei, B. Bahrak, A. Shakery, *UTNLP at SemEval-2021 Task 5: A Comparative Analysis of Toxic Span Detection using Attention-based, Named Entity Recognition, and Ensemble Models*, International Workshop on Semantic Evaluation (SemEval), 2021.

9. N. Sabri, A. Edalat, B. Bahrak, *Sentiment Analysis of Persian-English Code-mixed Texts*, International Computer Conference, Computer Society of Iran (CSICC), 2021.

8. H. Safari, N. Sabri, F. Shahsavan, B. Bahrak, *An Analysis of GitLab's Users and Projects Networks*, International Symposium on Telecommunications (IST), 2020.

7. A. Ullah, S. Bhattarai, J.M. Park, J.H. Reed, D. Gurney, B. Bahrak, *Multi-tier Exclusion Zones for Dynamic Spectrum Sharing*, IEEE International Conference on Communications (ICC), 2015.

6. B. Bahrak, S. Bhattarai, A. Ullah, J.M. Park, J.H. Reed, D. Gurney, *Protecting the Primary Users' Operational Privacy in Spectrum Sharing*, IEEE International Symposium on Dynamic Spectrum Access Networks (DySpAN), 2014.

5. B. Bahrak, J.M. Park, H. Wu, *Ontology-based Spectrum Access Policies for Policy-based Cognitive Radios*, IEEE International Symposium on Dynamic Spectrum Access Networks (DySpAN), 2012.

4. B. Bahrak, A. Deshpande, M. Whitaker, J.M. Park, *Bresap: A Policy Reasoner for Processing Spectrum Access Policies Represented by Binary Decision Diagrams*, IEEE International Symposium on Dynamic Spectrum Access Networks (DySpAN), 2010.

3. B. Bahrak, T. Eghlidos, M.R. Aref, *Impossible Differential Cryptanalysis of Safer++*, International Conference on Security and Management, 2008.

2. B. Bahrak, T. Eghlidos and M.R. Aref, *Impossible Differential Cryptanalysis of Crypton*, International ISC Conference on Information Security and Cryptology (ISCISC), 2008.

1. B. Bahrak, M.R. Aref, *A Novel Impossible Differential Cryptanalysis of AES*, Western European Workshop on Research in Cryptology, 2007.