Azadeh Tabiban

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Research Interests

Cloud/edge security, provenance analysis and forensics, NFV and network security, machine learning applied to security.

Academic Background

- **Ph.D. in Information and Systems Engineering** Aug. 2018 - Oct. 2022
  Concordia University, Montreal, QC, Canada
- **Master's in Information Systems Security** Graduated: May 2018
  Concordia University, Montreal, QC, Canada
- **Bachelor's in Computer Engineering** Graduated: Sep. 2013
  Shahid Beheshti University, Tehran, Tehran, Iran

Publications

1. **Azadeh Tabiban**, Heyang Zhao, Yosr Jarraya, Makan Pourzandi, Mengyuan Zhang and Lingyu Wang, "ProvTalk: Towards Interpretable Multi-level Provenance Analysis in Networking Function Virtualization (NFV)", Proc. the Network and Distributed System Security Symposium (NDSS 2022), San Diego, USA, 24 – 28 April, 2022. (Acceptance ratio 16.2%, the only paper accepted from Canada).

2. **Azadeh Tabiban**, Heyang Zhao, Yosr Jarraya, Makan Pourzandi and Lingyu Wang, "VinciDecoder: Automatically Interpreting Provenance Graphs into Textual Forensic Reports with Application to OpenStack", Proc. the 27th Nordic Conference on Secure IT Systems (NordSec 2022), 30 November 2022 - 2 December 2022, Iceland (Acceptance ratio 20/89≈22.47%).

3. **Azadeh Tabiban**, Yosr Jarraya, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang and Mourad Debbabi, "Catching Falling Dominoes: Cloud Management-Level Provenance Analysis with Application to OpenStack", Proc. the 8th IEEE Conference on Communications and Network Security (CNS 2020), Avignon, France, 29 June - 1 July, 2020. (Acceptance ratio 43/151≈28% - Selected as a best paper candidate).

4. **Azadeh Tabiban**, Suryadipta Majumdar, Lingyu Wang and Mourad Debbabi, "PERMON: An OpenStack Middleware for Runtime Security Policy Enforcement in Clouds", Proc. the 4th IEEE Workshop on Security and Privacy in the Cloud (SPC 2018), Beijing, China, May 30-June 1, 2018.

5. Suryadipta Majumdar, **Azadeh Tabiban**, Meisam Mohammady, Alaa Oqaily, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi, "Proactivizer: Transforming Existing Verification Tools into Efficient Solutions for Runtime Security Enforcement", Proc. the 24th European Symposium on Research in Computer Security (ESORICS 2019), Luxembourg, September 23-27, 2019. (Acceptance ratio 67/344≈19.5%)

6. Suryadipta Majumdar, **Azadeh Tabiban**, Meisam Mohammady, Alaa Oqaily, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi, "Multi-Level Proactive Security Auditing for Cloud", Proc. the IEEE Conference on Dependable and Secure Computing (DSC 2019), Hangzhou, China, November 18-20, 2019

7. Suryadipta Majumdar, **Azadeh Tabiban**, Yosr Jarraya, Momen Oqaily, Amir Alimohammadifar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi, "Learning Probabilistic Dependencies among Events for Proactive Security Auditing in Clouds", Journal of Computer Security (JCS), Vol. 27, No. 2, March 2019, pages 165-202

8. Suryadipta Majumdar, Taous Madi, Yushun Wang, **Azadeh Tabiban**, Momen Oqaily, Amir Alimohammadifar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi, "Cloud Security Auditing", Springer, 2019, ISBN 978-3-030-23127-9.

9. "Making Provenance Graphs Talk using Neural Machine Translation", US Provisional Patent Application, Filed February, 2022

- **Under Review**

10. **Azadeh Tabiban**, Mohammad Ekramul Kabir, Makan Pourzandi, Yosr Jarraya, Mengyuan Zhang, Lingyu Wang and Mourad Debbabi, "DominoBlocker: Preventing Recurring Security Incidents in Clouds via Management-level Provenance Analysis", Submitted to the IEEE Transactions on Dependable and Secure Computing (TDSC).

Notes on the nature of the field. Unlike other fields, the most competitive venues for security research are refereed conferences, as opposed to refereed journals. Network and Distributed System Security Symposium (NDSS) is one of the top-tier "Big 4" conferences for security research and is widely monitored.

Evidence of Impact

- **Industrial Demonstrations (Selected)**

1. "Demo on ML-driven Provenance Analysis", Presented at Ericsson Research Day, 2020

2. "Demo on Provenance-based Root Cause Analysis", Ericsson Security Research Labs, 2019

3. "Demo on Proactive Compliance Verification in NFV", Presented to a major North American telecommunication company, 2019

4. "Demo on Proactive Compliance Verification", Presented at Ericsson Research Day, 2017

- **Talks and Seminars**

5. "VinciDecoder: Automatically Interpreting Provenance Graphs into Textual Forensic Reports with Application to OpenStack", Nordic Conference on Secure IT Systems (NordSec 2022), 30 November 2022 - 2 December 2022 (planned).

6. "Provenance Analysis in Virtualized Environments", McGill University, 20 September, 2022.

7. "Provenance Analysis in Virtualized Environments", McMaster University, 5 May, 2022.

8. "ProvTalk: Towards Interpretable Multi-level Provenance Analysis in Networking Function Virtualization (NFV)", Network and Distributed System Security Symposium (NDSS 2022), 24 – 28 April, 2022.

9. "Cloud Management-Level Provenance Analysis with Application to OpenStack", Cybereco, 5 May, 2021.

10. "Catching Falling Dominoes: Cloud Management-Level Provenance Analysis with Application to Open-Stack", Communications and Network Security (CNS 2020), 29 June - 1 July, 2020.

- **Media**

11. Ericsson Blog: "Can AI speed up the root cause analysis of network security incidents?" - Based on ProvTalk (our NDSS paper), 27 September, 2022

    - Link: https://www.ericsson.com/en/blog/2022/9/ai-root-cause-analysis

12. Concordia News: "Concordia researcher looks to create an added layer of protection for cloud-based technologies" - 6 December, 2019.

    - Link: https://www.concordia.ca/news/stories/2019/12/06/concordia-researcher-looks-to-create-an-added-layer-of-protection-for-cloud-based-technologies.html

Research Experience

- **Research Assistant**   Sep. 2019 - present
  NSERC/Ericsson IRC in SDN/NFV Security project
  - Concordia University, Montreal, QC, Canada
  - Ongoing research on provenance analysis in virtualized environments

- **Research Assistant**   Jun. 2017 - Sep. 2019
  Audit Ready Cloud (NSERC/Ericsson CRD project)
  - Concordia University, Montreal, QC, Canada
  - Research on cloud security auditing

- **Research Assistant**   Jun. 2017 - Oct. 2017
  Ericsson/Concordia Mitacs Intern
  - Concordia University, Montreal, QC, Canada
  - Research on cloud security auditing

Teaching Experience

- **Guest Lecturer**

    - INSE 6620: Cloud Computing Security and Privacy, Summer 2020, Summer 2021 and Summer 2022
    - INSE 6130: Operating System Security, Fall 2022

- **Teaching Assistant** (programmer on duty, lab demonstrator, tutor and marker)

    1. INSE 6140: Malware Defenses and Application Security, Winter 2022 - 56 students

2. INSE 6130: Operating System Security, Fall 2021 - 118 students

3. INSE 6620: Cloud Computing Security, Summer 2020 - 84 students

4. INSE 6140: Malware Defenses and Application Security, Winter 2021 - 46 students

5. INSE 6130: Operating System Security, Fall 2020 - 61 students

6. INSE 6130: Operating System Security, Winter 2020 - 99 students

7. INSE 6130: Operating System Security, Fall 2018 - 100 students

Academic Service

- Conference Organization
  - Publicity Chair, Workshop on Privacy in the Electronic Society, 2022 (in conjunction with ACM CCS)

- Book Proposal Review
  - Springer Nature

- Journal Reviews
  - IEEE Transactions on Dependable and Secure Computing (TDSC) (five assignments-2022)
  - Annals of Telecommunications (ANTE) (one assignment-2022)
  - IEEE Access (one assignment-2020)
  - Journal of Information Security and Applications (one assignment-2020)

- Conference External Reviews (Selected)
  - The 32nd Web Conference - Security, Privacy, and Trust track (WWW 2023)
  - The 27th European Symposium on Research in Computer Security (ESORICS'22)
  - The 36th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec'22)
  - The 35th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec'21)
  - The 26th European Symposium on Research in Computer Security (ESORICS'21)
  - The 25th European Symposium on Research in Computer Security (ESORICS'20)
  - The 34th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec'20)
  - The 8th IEEE Conference on Communications and Network Security (CNS'20)
  - The 18th International Conference on Applied Cryptography and Network Security (ACNS'20)
  - The 21st International Conference on Information and Communications Security (ICICS'19)
  - The 24th European Symposium on Research in Computer Security (ESORICS'19)
  - The 34th IFIP TC-11 SEC 2019 International Information Security and Privacy Conference (SEC'19)
  - The 23rd European Symposium on Research in Computer Security (ESORICS'18)

Mentorship

- Alumni Master's student: Heyang Zhao (Ericsson/Concordia Mitacs intern)

- Current Master's and PhD students: Hugo Kermabon-Bobinnec, Mahmood Gholipour, Sima Bagheri and A S M Asadujjaman

Grant

NDSS Student Grant (Awarded ≈34% of applicants) 2022
ESORICS Student Travel Grant 2019

References

- Dr. Lingyu Wang
  Professor, Concordia Research Chair
  Concordia Institute for Information Systems Engineering (CIISE), Concordia University
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- Dr. Makan Pourzandi
  Research Leader, Ericsson Research
  Adjunct Professor, Concordia Institute for Information Systems Engineering (CIISE)
  Concordia University
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- Dr. Mourad Debbabi
  Dean, Research and Graduate Studies
  Professor & Tier, Concordia Research Chair
  Concordia Institute for Information Systems Engineering (CIISE), Concordia University
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