ADRIAN (SHUAI) LI

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EDUCATION

Purdue University   **Expected Graduation Date: Dec 2025**
Ph.D. in Computer Science, Advisor: Elisa Bertino, GPA: 4.0/4.0   West Lafayette, IN

University of Calgary   **January 2020**
M.Sc. in Computer Science, Advisor: Rei Safavi-Naini, GPA: 4.0/4.0   Calgary, Canada
Master Thesis: A Capability-based System to Enforce Context-aware Permission Sequences

Wuhan University   **July 2017**
BSc. in Computer Science, GPA: 3.7/4.0   Wuhan, China

EXPERIENCE

Cisco Research   **May 2023 – Aug 2023**
Research Intern III   San Jose, CA

- Developed an automated solution for extracting control flow graphs (CFGs) from complex software binaries
- Implemented a pipeline to create high-quality instruction embeddings for CFGs, demonstrating a novel approach to enhancing software analysis
- Addressed the distribution shift between old and new malware, boosting knowledge transfer efficacy through integrating GNN and domain adaptation that doubled accuracy compared to conventional methods

Aviatrix Systems   **May 2022 – Aug 2022**
Software Developer Intern   Champaign, IL

- Implemented a pipeline that can efficiently extract, transform, and load large-scale network performance data from Elasticsearch indices as Spark dataframes for ML analytics
- Created realistic network anomaly training data by replaying malicious network traces across AWS VPCs and extracting features from the traffic
- Developed a highly accurate prediction system based on Spark MLlib using different ML models for network intrusion detection

Purdue University   **May 2021 – Present**
Graduate Research Assistant   West Lafayette, IN

- Developed a multi-source adversarial domain adaptation algorithm able to detect anomalies on the target network with significantly small labeled data by transferring knowledge gained from the existing network intrusion training data
- Proposed a novel cross-domain transfer learning approach for highly accurate image classification with no labeled samples from the target domain - **this work is in collaboration with IBM TJ Watson Research Center**

Purdue University   **January 2021 – May 2021**
Modbus over QUIC   West Lafayette, IN

- Designed and developed an industrial control system network running over QUIC to eliminate the head-of-line blocking issues inherent with TCP and provide lower-latency connection establishment than TCP + TLS (project page)
- Simulated the network communications on a mininet virtual network with various network conditions (delay, packet loss) and evaluated the connection latency using Wireshark

TELUS Communications   **March 2020 – September 2020**
Security Research Intern   Calgary, Canada

- Implemented context-aware token-based authentication in Ansible tower
- Contributed python codes to Ansible Tower's open source project (AWX)

University of Calgary   **September 2017 – January 2020**
Graduate Research Assistant   Calgary, Canada

- Developed a distributed token-based authorization system that provides efficient and refined (conditional) access to data with security guarantee (paper link)
- Designed cryptographic authentication and OAuth 2.0 based authorization for a home hub that continues to provide essential services in a cloud-based smart home when the cloud is unavailable (paper link)

Publications

Li, A. S., Bertino, E., Dang, X. H., Singla, A., Tu, Y., & Wegman, M. N. (2023). Maximal Domain Independent Representations Improve Transfer Learning. arXiv preprint arXiv:2306.00262.

Bertino, E., Bhardwaj, S., Cicala, F., Gong, S., Karim, I., Katsis, C., Lee, H., **Li, A.S.** and Mahgoub, A.Y., 2023. Machine Learning Techniques for Cybersecurity. Springer Nature.

Li, A. S., Bertino, E., Wu, R. T., & Wu, T. Y. (2023, April). Building Manufacturing Deep Learning Models with Minimal and Imbalanced Training Data Using Domain Adaptation and Data Augmentation. In 2023 IEEE International Conference on Industrial Technology (ICIT) (pp. 1-8). IEEE.

Li, A. S., Safavi-Naini, R., & Fong, P. W. (2022, June). A Capability-based Distributed Authorization System to Enforce Context-aware Permission Sequences. In Proceedings of the 27th ACM on Symposium on Access Control Models and Technologies (SACMAT) (pp. 195-206).

Li, S. (2020). A Capability-based System to Enforce Context-aware Permission Sequence (Master's thesis, Science).

Avizheh, S., Safavi-Naini, R., & **Li, S.** (2020). Secure Logging with Security Against Adaptive Crash Attack. In Foundations and Practice of Security: 12th International Symposium, FPS 2019, Toulouse, France (pp. 137-155). Springer International Publishing.

Doan, T. T., Safavi-Naini, R., **Li, S.**, Avizheh, S., K, M. V., & Fong, P. W. (2018, August). Towards a resilient smart home. In Proceedings of the ACM SIGCOMM 2018 Workshop on IoT Security and Privacy (IoT S&P).

Technical Skills

Programming: Python, SQL, Node.js
Cloud & Networking: AWS EC2/S3/security groups, Azure, GCP, Wireshark, MININET, ONOS, OpenSSL, dnSpy, tcpreplay
ML & Data Science: Spark, MLlib, Pandas, NumPy, Tensorflow, Scikit-learn, Keras, Elasticsearch, MongoDB
General: Django, Git, Docker, Ansible, Apache JMeter, Postman

Cloud Networking Certificate

Aviatrix Systems   **May 2022**
Multi-Cloud Network Professional

Additional Experience

Purdue University   **January 2021 – May 2021**
Graduate Teaching Assistant for CS 182   West Lafayette, IN
- Implemented interactive teaching philosophy in the lab sessions to promote understanding of the foundations of computer science
- Constructed and graded assignments to facilitate materials covered in class

University of Calgary Computer Science Graduate Society   **June 2018 – May 2019**
Vice President   Calgary, Canada
- Organized and marketed over eight social events and academic workshops to enhance student activity in the graduate community
- Applied and received $10,000 grant to support society budget

Security Researchers and Industry Experts Talks   **Sep 2018**
Program Committee   Calgary, Canada
- Arranged venues and catering for a full-day event with over 50 participants