Alireza Bahramali

413-230-8939 | abahramali@cs.umass.edu | LinkedIn

Education

University of Massachusetts Amherst — Amherst, MA
PhD in Computer Science; GPA: 3.94 — Sep. 2017 – Dec. 2022 (Expected)

University of Massachusetts Amherst — Amherst, MA
MS in Computer Science; GPA: 3.94 — Sep. 2017 – Sep. 2020

University of Tehran — Tehran, Iran
BS in Electrical and Computer Engineering; GAP: 3.68 — Sep. 2012 – Jun. 2017

Experience

Data Science Intern — Jun. 2021 – Aug. 2021
Faire — Search and Recommendations Team — San Francisco, CA

- Implemented an XGBoost binary classifier to perform ranking and recommend products from the same brand - **Python, SQL**.
- **Improved** the impression_to_click_rate of the recommender system by **12% - A/B testing, Python, SQL**.
- Performed user analytic and data model review for different parts of Faire website - **SQL**.

Graduate Research Assistant — Sep. 2017 – Present
The SPIN Research Group, UMass Amherst — Amherst, MA

- Implemented a framework to perform traffic analysis on Tor connections using **Deep Learning (DL)**, **Python**, and **PyTorch**. Improved the flow correlation accuracy on Tor connections by **92%**.
- Developed a framework to perform traffic analysis on messaging applications using **REST API** and **Python**.
- Designed **Universal Adversarial Examples** to defeat DL-based traffic analysis attacks such as website fingerprinting and flow correlation using **Python** and **PyTorch**. Reduced the accuracy of such attacks by **90%** by only adding **10%** bandwidth overhead.
- Integrated DL models such as **RESNET** and Adversarial Example defense techniques such as **Adversarial Training**, **Randomized Smoothing**, **Input-Gradient Regularization**, and **Region-based Classification** into network traffic domain.

Technical Skills

Programming Languages: Python, PyTorch, SQL, C/C++, TensorFlow.
Developer Tools: GitHub, scikit-learn, Keras, pandas DataFrame, CUDA, Linux, Git, REST API, Docker, Selenium, Tor, Jupyter Notebooks.
Expertise: Traffic Analysis, Data Structures, Deep Learning, Machine Learning, Generative Adversarial Networks (GAN), Adversarial Examples, Network Security, Network Programming, Algorithms, Wireless Communication Systems.

Projects

Simple LinkedIn | ***C++, Object Oriented Programming, QT***

- Developed a social network similar to LinkedIn using C++ and Qt as the user interface.

Packet Scheduling | ***C++, Object Oriented Programming, Graph Theory***

- Implemented and compared packet scheduling algorithms in network switches using C++ and graph theory.

English Premier League Prediction | ***Python, PyTorch***

- Designed a DL classifier to predict English Premier League soccer matches using PyTorch.

Top-K Insights From Multi-Dimensional Data | ***Python, pandas DataFrames, MySQL***

- Automated the process of extracting useful insights from multi-dimensional data.

Messaging Application Bots | ***Python, REST API, Selenium, Docker***

- Automated message sending and receiving in Telegram, Signal, and Wickr using Python and REST API.

Publications

- Bahramali A., Nasr M., Houmansadr A., Goeckel D., Towesly D. **Robust Adversarial Attacks Against DNN-Based Wireless Communication Systems.** *The ACM Conference on Computer and Communications Security.* 2021.
- Nasr M., Bahramali A., Houmansadr A. **Defeating Deep Neural Network (DNN)-Based Traffic Analysis Systems in Real-Time With Blind Adversarial Perturbations.** *The USENIX Security Symposium.* 2021.
- Bahramali A., Soltani R., Houmansadr A., Goeckel D., Towesly D. **Practical Traffic Analysis Attacks on Secure Messaging Applications.** *The Network and Distributed System Security Symposium.* 2020.
- Nasr M., Bahramali A., Houmansadr A. **DeepCorr: Strong Flow Correlation Attacks on Tor Using Deep Learning.** *The ACM Conference on Computer and Communications Security.* 2018.

Honours

- Ranked 70th among 260000 participants in Iran's National Universities Entrance Exam (Konkur), 2012.