Yuhang Lin

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EDUCATION

PhD in Computer Science (advisor: Xiaohui Gu)

North Carolina State University, Raleigh, NC, USA M.S. in Computer Science (advisor: Byung Suk Lee) University of Vermont, Burlington, VT, USA

WORK EXPERIENCE

Software Engineer Intern, Meta

- Implemented and evaluated a cross-platform mobile tagging system in C++ for Facebook Messenger.
- o Designed a Spark transformer based automatic tagging quality evaluation system.
- Over 67% messages have better tagging quality than the current Android Facebook Messenger app.

Software Engineer Intern, Facebook

• Designed and implemented a semi-supervised machine learning framework, aiming to quickly learn new listing imaging concepts, in Python for Facebook Marketplace.

TECHNICAL SKILLS

o Programming: Java, Python, C, C++, Bash, PHP, JavaScript, XML, MATLAB, C#

- o Machine Learning: scikit-learn, TensorFlow, Keras, Weka, Massive Online Analysis
- o Others: Git, Kubernetes, Hadoop, Docker, AWS, Jmeter, Sysdig, MySQL, Reinforcement Learning

PROJECTS

Machine Learning Based Container Security Attack Detection and Patching

- Integrated application classification using random forest and autoencoder-based anomaly detection to overcome the challenge of insufficient training data while considering diversified behaviors among applications. Improved attack detection from 61% to 94% while reducing false positive rate from over 12% to 0.24%.
- Combined attack detection with **dynamic targeted patching** to provide efficient and effective security protection for containerized applications just in time, and reduced patching overhead by up to 84%.
- Introduced **hybrid learning** by combing anomaly detection with supervised learning and reduced false positive rate by 39-91% with similar or higher detection rate.

Container Scaling with Deep Reinforcement Learning

 Built an auto-scaling system for Docker containers using deep reinforcement learning in Python, Java and bash. Achieved accuracy of 81.35% by using the best model of policy gradient with LSTM.

Continuous Detection of Abnormal Heartbeats

 Created an efficient online detection system in Java to analyze electrocardiogram data stream using Microcluster-based Continuous Outlier Detection algorithm with 83% sensitivity and 88% specificity.

SELECTED PUBLICATIONS

- Lin, Y., Olufogorehan, T., Gu, X., He, J. and Latapie H., 2022. SHIL: Self-Supervised Hybrid Learning for Security Attack Detection in Containerized Applications. In Proc. of the 3rd IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS).
- He, J., Lin, Y., Gu, X., Yeh, C.C.M. and Zhuang, Z., 2022. PerfSig: Extracting Performance Bug Signatures via Multimodality Causal Analysis. In Proc. of the 44th International Conference on Software Engineering (ICSE).
- Lin, Y., Olufogorehan, T. and Gu, X., 2020. CDL: Classified Distributed Learning for Detecting Security Attacks in Containerized Applications. In Proc. of Annual Computer Security Applications Conference (ACSAC).

Aug 2018 – Sept 2023 (expected) GPA: 3.93 Aug 2016 – May 2018 GPA: 3.96

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Summer 2022

Summer 2021