

HEBA Z ALAWNEH

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EXPERIENCE

Assistant Professor

Princess Sumaya University

Sep 2020 – present

Amman, Jordan

Network and Information Security Engineering

Graduate Research Assistant

Auburn Cyber Research Center

May 2016 – Aug 2020

Auburn, AL

- Research and develop state of the art techniques in the field of deep learning applied in various real-world security applications.
- Developed a dynamic Android malware detection framework using Recurrent Neural Networks(RNNs) and process control block information (PCB).
- Customized Linux kernel and develop kernel modules to collect PCB records triggered by context switching and deliver them to the user-space.

Computer Engineer Intern

Nano Technology Center

Jan – May 2014

Irbid, Jordan

- Automate controlling miniature manipulator using computer vision to recognize and detect motion of Nano-objects.

SKILLS

Linux Windows Android Python C/C++ C# Java Matlab
ARM & x86 Assembly Tensorflow Keras Theano Caffe
Deep Learning Adversarial Machine Learning Data Mining Big Data
Kernel Development GPU programming OO Design Application Security
Reverse Engineering Software Development Process Management

EDUCATION

Ph.D. in Computer Science

Auburn University

May 2016 – Aug 2020 – GPA: 3.73

Dissertation title: **Android Malware Detection Using Data Mining Techniques on Process Control Block Information.**

M.Sc. in Computer Science

Auburn University

May 2016 – 2018 – GPA: 3.77

B.Sc. in Computer Engineering

Jordan University of Science and Technology

Aug 2010 – Jun 2015 – GPA: 82%

PROJECTS

Android Malware Detection Using Deep Learning Techniques on Process Control Block (PCB) Information

Aug 2016–2020

Auburn University

dynamic malware detection approach using deep learning techniques on the PCB information mined over time. The detection model that combines CNN, LSTM, and DNN achieved an F1-score of 95.8% using 12 PCBs. **Technologies:** RNNs, CNNs, Deep learning, Android kernel, C, Python, Keras.

Automation of Extracting Decision Rules from E-commerce Web Applications

Jan-Jun 2020

Auburn University

A framework to extract decision business rules from E-commerce web applications without prior knowledge of their implemented business rules. The proposed solution adapt process mining and machine learning techniques to extract candidate decision business rules of a web application based on its dynamic behavior when in use. **Technologies:** Process Mining, Machine Learning, Burp Suite Extender, Java, SQLite.

Extracting Process Control Block (PCB) Information from Android Kernel

May 2019–2020

Auburn University

Building a module to collect PCB information for a specific process determined by the user through virtual filesystems (/proc), and modifying the kernel to trigger data collection by context switching. Which required batching Android kernel for Google Pixel 2 and OnePlus 5T phones to enable kernel module insertion. **Technologies:** C, Linux Kernel Development, Python, shell Script.

Tampered Image Detection Using ConvNets (CNNs)

Feb-May 2018

Auburn University

A deep learning-based tool to detect authentic-like images of various sizes using a modified GoogleNet, a modified conv layer, and an additional channel of error level analysis. **Technologies:** Deep learning, CNNs, Error level Analysis (ELA), Structural Similarity Index algorithm SSIM.

Adversarial Machine learning on GRNN-based web crawler

Sep-Nov 2017

Auburn University

A neural network-based web crawler to detect malicious websites based on their HTML Ngrams as well as detecting adversarial attacks against the ML model. **Technologies:** GRNN, Genetic Algorithms, python.

PUBLICATIONS & PRESENTATIONS

- Alawneh, Heba, Skjellum Anthony, and Umphress David. "Android Malware Detection using Neural Networks & Process Control Block Information". In: Accepted to: 14th IEEE International Conference on Malicious and Unwanted Software MALCON2019.
- Alawneh, Heba (2020). "Android Malware Detection Using Data Mining Techniques on Process Control Block Information". PhD dissertation. Auburn University.
- Leatherland, Terry et al. (2016). "Accelerating Machine Learning for Malware with IBM POWER8 and GP-GPU Acceleration". In: Presentation. IBM.Edge2016 The Premier IT Infrastructure Conference.

LANGUAGES

Arabic
English

