Ahmed Saad

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LinkedIn: www.linkedin.com/in/engahmedmsaad

Work: Kingston (Canada)

EDUCATION AND TRAINING

Ph.D. Computing

Queen's University [05/09/2023 – Current]

City: Kingston | **Country:** Canada

- CGPA: 4.2 / 4.3
- Courses Completed: Introduction to Cybersecurity, Cryptography, and Reinforcement Learning.

Ph.D. GeoSpatial Computer Science

Texas A&M University - Corpus Christi [16/01/2022 – 15/06/2023]

City: Texas | **Country:** United States

- CGPA: 3.5 / 4
- Finished all the program course requirements.
- Transferred to Queen's University, Canada.

(M.Sc. Exchange Studies) Computer & Systems Sciences

Stockholm University [16/01/2020 – 04/06/2020]

City: Stockholm | **Country:** Sweden

I did part of my M.Sc. at Stockholm University in Sweden under the Erasmus program, supported by the European Commission.

M.Sc. Computer Engineering

Atılım Üniversitesi [10/02/2019 – 29/06/2021]

City: Ankara | **Country:** Türkiye

- CGPA: 3.86 / 4
- Thesis Title: Reinforcement Learning for Intrusion Detection
- Supervisor: Assoc. Prof. Beytullah Yıldız
- Thesis Link: MSc Thesis

B.Sc. Computer and Systems Engineering

Akhbar ElYom Academy [09/09/2009 – 20/06/2014]

City: Giza | **Country:** Egypt

- CGPA: 81.66 / 100 or Very Good
- Final Year Grade: Distinction (92.2 / 100)
- Graduation Project: Hybrid Grid Computing
- Graduation Project Grade: Distinction
- Class Rank: 1st

PUBLICATIONS

[2019]

A Systematical Review Study to Investigate the Use of Biometric Security Techniques in Automatic Teller Machines: Insight from the Past 15 Years

- Link: https://ieeexplore.ieee.org/document/8965494

• IEEE Conference (IISEC 2019) [Accepted] [Published]

[2022]
Diagnosis of Cerebellar Ataxia Based on Gait Analysis Using Human Pose Estimation: A Deep Learning Approach

• Link: https://ieeexplore.ieee.org/document/10079396
• Dataset: https://data.mendeley.com/datasets/2vkk2r9tx3/1
• IEEE-EMBS Conference (IECBES 2022) [Accepted] [Published]

[2022]
Reinforcement Learning for Intrusion Detection

• Link: https://link.springer.com/chapter/10.1007/978-3-031-27099-4_18
• Springer Nature Book Series (Lecture Notes in Networks and Systems) [Accepted] [Published]

[2023]
Leveraging Graph Neural Networks for Botnet Detection

• Link: https://link.springer.com/chapter/10.1007/978-3-031-50920-9_11
• Springer Nature Book Series (Communications in Computer and Information Science) [Accepted] [Published]

[2024]
Towards Privacy-Preserving Medical Imaging: Federated Learning with Differential Privacy and Secure Aggregation Using a Modified ResNet Architecture

• Link: https://arxiv.org/abs/2412.00687
• 38th Conference on Neural Information Processing Systems (NeurIPS 2024) - MusIML Workshop [Accepted] [Published]

RESEARCH INTERESTS

Academic Interests

- AI-Enabled Cyber Security
- Trustworthy ML
- eXplainable Machine Learning (XAI)
- Deep Reinforcement Learning
- Deep Learning
- Data Privacy
- Cyber Security

PROJECTS

Projects

- **Leveraging Graph Neural Networks (GNN) for Botnet Detection**

In this research, an approach was developed by leveraging a graph-based learning approach known as Graph Neural Network (GNN) for botnet detection using network traffic features. GNN was mainly used to omit the feature engineering step of the machine learning pipeline as it is a costly and cumbersome process. This research will be the first attempt at using GNN for detecting botnets using network features present in the ISCX-Bot-2014 dataset.

Moreover, four different GNN models were tested using different hyperparameters to get an insight into the performance of each model. To generate training and testing data, a graph data object was created from the ISCX-Bot-2014 dataset. Confusion matrix metrics were used to evaluate each model's performance.

- **Smart Diagnostic Tool for Cerebellar Ataxia Based on Human Gait Analysis**

I collaborated with the Artificial Intelligence Center at MJIT to develop a deep-learning approach using LSTM to detect Cerebellar Ataxia by analyzing gait sequences using PyTorch. We constructed a novel human motion dataset of 2 million data points for ataxic gait from human subjects. The project was funded by the JACTIM Japan Foundation and produced a conference paper.

- **CNN & RNN Binary Classifier for Asirra Dataset**

Using Python I created and implemented a binary classifier for images. I used two different neural network types: convolution neural network (CNN) and recurrent neural net (RNN). I also compared the performance of the approaches using the Asirra dataset

- **Face detection using Viola-Jones Filter and KNN Algorithm**

Using Matlab I wrote a code for determining if a picture contains a face or not using Viola-Jones filter and KNN Algorithm.

- **Web Scraping Tool**

Using Python we created a tool to automate the scraping of websites and bypass its anti-scraping mechanism using the Selenium library and Gecko driver.

- **Path Generator for Acyclic SAGA**

Using Python we created software that generates possible workflows for different transactions in a database system.

- **Hybrid Grid Computing**

Designing, implementing, and building a grid computing network of applications from scratch for PCs (Microsoft Windows OS) and Smart Phones (Android OS). The applications were connected together and managed by a Web Service (Server & a Database) to perform high computational operations with less time. (In our project we used Encryption & Decryption to prove our Concept and to reduce the computation time) (We used Visual Basic for building the web service, Java for the Android application, MySQL for the database and C# for the Windows application)

M.SC. THESIS

M.Sc. Thesis

- **Reinforcement Learning for Intrusion Detection (M.Sc. Thesis)**

This is my M.Sc. Thesis where a novel approach was proposed and developed using deep reinforcement learning to detect intrusions to make network applications more secure, reliable, and efficient. As for the reinforcement learning approach, Deep Q-Learning is used alongside a custom-built Gym environment that mimics network attacks and guides the learning process. A supervised deep learning solution using a Long-Short Term Memory architecture is implemented to serve as a baseline. The NSL-KDD dataset is used to create the reinforcement learning environment and to train and evaluate the baseline model. The performance results of the proposed reinforcement learning approach show great superiority over the baseline model and the other relevant solutions from the literature.

- Link: https://dspace7.atilim.edu.tr/items/fc94dde1-685c-45d9-acd2-51b338337a71

TRAINING AND WORKSHOPS

Training and Workshops

- Cisco Certified Network Associate (CCNA)
- Matlab Workshop: Introduction and Basic Implementation
- Cyber Security Workshop: Security Fundamentals
- Micro-Controller Basic Application using C programming Language Workshop

RELATED SKILLS

Skills

- Python
- Deep Reinforcement Learning
- OpenAI Gym
- Machine Learning
- PyTorch
- Data Analytics
- Data Visualisation
- Exploratory Data Analysis (EDA)
- Deep Learning
- Graph Neural Network
- PyTorch Geometric
- XAI
- Secure Muli-party Computation (SMPC)
- CrypTen
- LaTeX
- Matlab
- XML and XPath
- Jupyter Notebook

DIGITAL SKILLS

Digital Skills

- Microsoft Office (PowerPoint, Excel, and Word)
- Apple iWork (Keynotes, Numbers, and Pages)
- Operating Systems: Mac OSX, Windows OS, Linux (Ubuntu)
- IDEs: VS Code and Spyder
- LaTeX: Overleaf
- Package Manager: pip and Conda
- Shell Environments: Tmux and Zsh
- Remote Services: Secure Shell Protocol (SSH)
- Version Control: Git

HONOURS AND AWARDS

[28/02/2023] Texas A&M University System

18th Annual TAMUS Pathways Student Research Symposium

I won the 2nd place for the best oral presentation for the Doctoral level in the Engineering and Computer science category across all Texas A&M system universities.

Link: https://www.tamucc.edu/news/2023/03/033023-islanders-victorious-at-tamus-pathways-student-research-symposium.php

[17/01/2023] Conrad Blucher Institute

Conrad Blucher Institute for Surveying and Science Scholarship

I got this scholarship and received 500 USD from the Conrad Blucher Institute for Surveying and Science Scholarship and Geospatial Surveying Engineering Scholarship for outstanding academic achievements.

[02/01/2021] Türkiye Scholarships

Success Scholarship Program

I received a merit-based scholarship for outstanding academic performance as an international student studying at a Turkish university. This scholarship provided a monthly stipend of 600 TL for one year, which I received during my master's studies.

[30/12/2019] European Commission

Erasmus+ Mobility Program

I was accepted into the Erasmus Mobility program to spend one semester at Stockholm University in Sweden. The program covered the tuition fees and a monthly stipend of 500 EUR per month.

[29/01/2019] Atılım Üniversitesi

Merit based tuition waiver scholarship

I received a tuition fee waiver from Atilim University during my admission for my master's degree for outstanding academic performance during my bachelor's degree.

[11/07/2014] Akhbar ElYom Academy

First in my class

I graduated as first in my class (Bachelor's Degree).

WORK EXPERIENCE

Graduate Research Assistant

Texas A&M University - Corpus Christi [24/01/2022 – 18/06/2023]

City: Texas | **Country:** United States

- I worked as a Graduate Research Assistant (GRA) at TAMU-CC.

Python Instructor (Women in Tech Program)

Paper Airplanes, Inc. [02/10/2021 – 18/12/2021]

Country: United States

- I volunteered as a remote instructor to teach an introductory course about Python (Programming Language). The program consisted of 10 weeks including 8 lessons, a final project, and a presentation. My students were women who are from areas that were affected by conflicts like Syria, Iraq, and Lebanon. The program focused

on getting conflict-affected women equipped with skills needed in the digital age. In addition, getting them more involved in the tech industry and help them have a better career and future.

ICT System Administrator

Rowifed Al Saadi Co. For Engineering & Construction [19/02/2017 – 30/01/2019]

City: Medina | **Country:** Saudi Arabia

- I was responsible for administrating, maintaining, and managing the IT infrastructure of the company (including servers, hardware, and software) and making sure that everything is functioning properly.

ICT System Administrator

Bana Medical Center [02/01/2016 – 16/02/2017]

City: Medina | **Country:** Saudi Arabia

- I was responsible for leading the technicians in building the infrastructure for the entire network in the medical center, installing different network devices (Cisco Switches, Routers, and TP-Link access points), and administering Windows Server 2008. I also participated in training receptionists, doctors, and accountants on how to use the DBMS and ERP systems. I was responsible for maintaining the IT infrastructure and making sure everything is functioning properly.

ICT Network Engineer

Aika IT [09/09/2015 – 21/12/2015]

City: Medina | **Country:** Saudi Arabia

- I was responsible for explaining the network design to the technicians and make sure they implemented it correctly. My other duties included testing, configuring, and maintaining the different devices (Routers, Switches, CCTV Cam, Access Point, etc...) connected to the network.

Sales engineer

Lighting Experts & Design Trading Co. [01/06/2015 – 28/08/2015]

City: Medina | **Country:** Saudi Arabia

- I was responsible for providing technical support to the customers, explaining the technical aspect of our products and identify the requirements, keep contact with customers, maintain a good relation with our clients and prepare quotations including technical data.

Sales engineer

Ez AlMawared Trading Co. [09/01/2015 – 27/05/2015]

City: Medina | **Country:** Saudi Arabia

- I was responsible for providing technical support to the customers, explaining the technical aspect of our products and identifying their requirements. My other duties included keeping contact with customers, maintain a good relation with our clients and preparing quotations including technical data.

IT Support Engineer

TE-Data [04/07/2014 – 20/12/2014]

City: Cairo | **Country:** Egypt

- I was responsible for providing technical support to the customers, identifying and resolving the issues they have. I was also responsible for guiding the technical team through the problem-solving steps and ensure the satisfaction of the customer.

ORGANISATIONAL SKILLS

Organisational Skills

- Adaptability and Flexibility.
- Analytical Thinking.

- Attention to Detail. Initiative.
- Innovation & Creative Thinking.
- Leadership & Management.
- Stress Tolerance.
- Teamwork.
- Willingness to learn.
- Persistence and Persuasion

LANGUAGE SKILLS

Mother tongue(s): Arabic

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** B2

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

NETWORKS AND MEMBERSHIPS

Memberships

- Member of The Egyptian Engineers Syndicate (Since 2014)
- Member of The Federation of Arab Engineers (Since 2014)
- Member of Saudi Council of Engineers (Since 2017)