HABEEB DIPO OLUFOWOBI

Assistant Professor, Department of Computer Science & Engineering

The University of Texas at Arlington

Phone: 817-272-3605 email:habeeb.olufowobi@uta.edu website: https://dipupo.github.io/index

EDUCATION

Howard University, Washington, DC **May 2019**

- **Ph.D. Computer Science**
- **Concentration:** Embedded Systems Security
- **Dissertation Topic:** Fail-Operational Intrusion Detection Systems (FO-IDS): A Mechanism for Securing Automotive In-Vehicle Networks

California State Polytechnic University, Pomona: **Dec. 2014**

- **Master of Science in Electrical Engineering:** Computer Systems Emphasis

Fountain University Osogbo, Nigeria **July 2011**

- **Bachelor of Science in Computer Science with honors**

RESEARCH INTEREST

Embedded System Security, Security in IoT, Network Security, Cloud Computing, Machine Learning and Data Provenance.

My research mainly focused on developing methods for ensuring the security and trustworthiness of embedded and distributed systems.

RESEARCH EXPERIENCE

Cyber-Physical Systems Security Lab, UT Arlington, Arlington, TX

Assistant Professor, Computer Science & Engineering **Aug. 2019 - Current**

Director, CSS Lab

Embedded System and Security Lab, Howard University, Washington, DC

Graduate Research Assistant/Project Lead **Jan. 2016 – Aug. 2019**

- **CARS** - "Cars Assuring Resilient Security"

  Involved in research that explores the security issues arising out of the growing use of electrical components that creates access points to vehicular distributed systems, that a potential hacker can exploit. Inherent security challenges such as distributed denial of service attacks, impersonation and fuzzy attacks are investigated to:
  - Establish theoretical foundations of fail-operational intrusion detection systems (FO-IDS),
  - Explore design space in the context of defending against attacks in automotive in-vehicle networks
  - Devise response and recovery protocols to ensure resilient operation, and
  - Evaluate the performance of the FO-IDS using actual vehicular test beds and data.
- Security and Data Provenance in Internet of Things (IoT)
  - This project is aimed at developing a framework that can be used to securely collect data provenance on memory constrained embedded systems device.

Oak Ridge National Lab: Research Intern **June 2017 – Aug. 2017**

In-vehicle network security research and development for the in-vehicle network (CAN bus) to:

- Detect when an attack is imminent or when anomalous events occur on the vehicular bus systems.
- Investigates on ways to mitigate such anomalies and attack as they occur.

- Demonstrates injection attacks on real vehicles to take control of critical functions.
- Evaluate the performance of the proposed detection strategies and how it impedes the performance of the vehicular operations.

IBM Research Lab, Almaden: Research Intern **June 2016 – Aug. 2016**

Developed a data provenance model for the Internet of Things (IoT) systems enabling:

- The verification of systems correctness, integrity, and transparency of information shared across IoT platform.
- Providing mechanisms to ensure secure code and data provenance management on IoT platform.
- Investigate how provenance graphs can be used to detect anomalies in shared information on the IoT platform.

Cal Poly Pomona ECE Dept.: Graduate Research Assistant **August 2013 – Dec. 2014**

- Worked on project involving creating a Smart Monitoring and Response Tool "SMART" to enable real-time energy management of a DC-based distributed micro grid.
- Studied concepts such as moving target defense, message authentication codes and AES encryption
- Created an Android application that provides a way to help people share rides and carpool that implements RSA encryption messages

TEACHING EXPERIENCE

- **University of Texas at Arlington**
  - Spring 2021
    - CSE 4344/5344 Computer Network
  - Fall 2020
    - CSE 5333/4392 Cloud Computing

- **UNCF HBCU CS Academy**
  - Summer 2020
    - Data Structures and Algorithms

- **Howard University, Washington, DC**
  - Spring 2020
    - CSCI 136 Computer Science II – Intro to Data Structures & Algorithm
    - CSCI 354 Computer Science III - Data structures & algorithms
  - Fall 2019
    - CSCI 365 Cloud Computing
    - CSCI 354 Computer Science III - Data structures & algorithms
  - Spring 2018
    - EECE 156 Math I Laboratory
  - Fall 2017 - **Teaching Assistant**
    - Operating Systems Concept
    - Computer Organization I, II
  - Spring 2016 - **Teaching Assistant**

        - Computer Organization I, II
    - Fall 2016 - **Teaching Assistant**
        - Modelling and Simulation

- **California State Polytechnic University, Pomona - Teaching Assistant**
    - Spring 2014
        - Electromagnetic Fields
    - Winter 2014
        - Software Engineering

PROFESSIONAL EXPERIENCE

Synaptics: HISD Project Management Intern **June 2014 – Sept. 2014**

- Provide DFT (Design for Test) feedback to design hardware and firmware team
- Design and document electrical/electronic aspects of functional test systems.
- Create test specification to ensure appropriate product test coverage.
- Work with mechanical engineering and 3rd party system builders to build mechanical fixturing and enclosures.
- Manage and report on test development project deliverables including schedule and cost.
- Create, manage and maintained the system BOMs for projects in Agile

Etisalat Nigeria (EMTS): Analyst, IT Service Desk and Incident Management **Dec. 2011 – Jan. 2013**

- Served as a member of the project team that designed and delivered the SAP-e-procurement (Supplier Relationship Management, Contract Lifecycle Management, Spend Performance Management, and Master Data)
- Served as a member of O2D project team, developing strategies to ensure compliance with new industry standards for electronic exchange.
- Providing first and second level support in the event of incidents/downtimes to application and hardware.
- Design, implement, and manage network server software and hardware.

MENTORSHIP

- **Jeffrey Arukwe,** PhD student, Computer Science
- **Emmanuel Oseghale,** PhD student, Computer Science
- **Sai Spandana Gali,** MS student, Computer Science
- **Karki Kiran,** Undergraduate student, Computer Science
- **Nikesh Subedi,** Undergraduate student, Computer Science

PUBLICATIONS

- **Journals**
    - Olufowobi, Habeeb, Young, Clinton, Zambreno, Joseph, and Bloom, Gedare. "SAIDuCANT: Specification-based Automotive Intrusion Detection using Controller Area Network (CAN) Timing." *IEEE Transactions on Vehicular Technology (TVT) 2019*.
    - Young, Clinton, Olufowobi, Habeeb, Zambreno, Joseph, and Bloom, Gedare. “Survey of Automotive Controller Area Network Intrusion Detection Systems.” *IEEE Design & Test* (2019).

- **Conference and Workshop Articles**
    - Ezeobi, Uchenna, Habeeb Olufowobi, Clinton Young, Joseph Zambreno, and Gedare Bloom. "Reverse Engineering Controller Area Network Messages using Unsupervised Machine Learning." IEEE Consumer Electronics Magazine (2020).
    - Ebelechukwu Nwafor and Olufowobi, Habeeb. "Towards an Interactive Visualization Framework for IoT Device Data Flow." *IEEE Workshop on Internet of Things Data Analytics (IoTDA) 2019.*
    - Olufowobi, Habeeb, Sena Hounsinou and Bloom, Gedare. "Controller Area Network Intrusion Prevention System Leveraging Fault Recovery." *ACM Workshop on Cyber-Physical Systems Security & Privacy (CPS-SPC'19).*
    - Olufowobi, Habeeb**,** Ezeobi, Uchenna, Muhati, Eric, Young, Clinton, Zambreno, Joseph, and Bloom, Gedare. "Anomaly Detection Approach Using Adaptive Cumulative Sum Algorithm for Controller Area Network". *Proceedings of the ACM Workshop on Automotive Cybersecurity. ACM, 2019.*
    - Young, Clinton, Olufowobi, Habeeb, Zambreno, Joseph, and Bloom, Gedare. "Automotive Intrusion Detection Based on Constant CAN Message Frequencies Across Vehicle Driving Modes". *Proceedings of the ACM Workshop on Automotive Cybersecurity. ACM, 2019.*
    - Olufowobi, Habeeb, Young, Clinton, Zambreno, Joseph, and Bloom, Gedare. "WiP: Real-Time Modeling for Intrusion Detection in Automotive Controller Area Network." *Real-Time Systems Symposium (RTSS), 2018 IEEE*. IEEE, 2018.
    - Parwez, Md Salik, and Olufowobi, Habeeb. "Cost-constrained Handoff in Next Generation Heterogeneous Wireless Networks". *Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON), 2018 IEEE 9th Annual*. IEEE.
    - Olufowobi, Habeeb, Engel, Robert, Baracaldo, Nathalie, Bathen, Luis Angel D., Tata, Samir, and Ludwig, Heiko. "Data Provenance Model for Internet of Things (IoT) Systems." *International Conference on Service-Oriented Computing*. Springer, Cham, 2016.
- **Book Chapter**
    - Olufowobi, Habeeb and Gedare Bloom. "Connected Cars: Automotive Cybersecurity and Privacy for Smart Cities." In *Smart Cities Cybersecurity and Privacy*, pp. 227-240. Elsevier, 2019.

INVITED TALKS

- **Florida A&M University Thought Leaders Series**. Autonomous Security. April 10, 2020
- **University of Nevada Las Vegas**. Automotive Intrusion Detection using CAN Timing. May 15, 2019
- **Fairleigh Dickinson University Teaneck.** Provenance Model in IoT System. March 13, 2019

AWARDS AND GRANTS

- **Grants in Submission**
    - CRII: SaTC: Securing Content-Centric Networking for Internet of Vehicles against Poisoning Attack
- **Awards**
    - HBCU Blockchain Course Development Proposal Award, 2019
    - Real-Time System Symposium Travel Award, 2018
    - Trans-Atlantic Symposium on Technology and Policy Travel Award, 2017
    - CPS Week Student Travel Award, Carnegie Melon University 2017
    - IEEE Security Development Conference Travel Award, 2016
    - Dean's List – California State Polytechnic University, Pomona, 2014

- Chancellor's Prize - Best Graduating Student in the University, Fountain University, 2011
- College Prize - Best Graduating Student in Sciences, Fountain University, 2011
- Fountain University Scholar Award, in recognition of excellence in academic performance, 2008 – 2011

CERTIFICATIONS

- **PMI Project Management Professional (PMP)**
- **ITIL, SSYB and SFC Certified**

PROFESSIONAL SERVICE

- **Reviewer:** IEEE Transaction on Vehicular Technology
- **Reviewer:** ACM SIGCSE
- **TPC –** Real Time System Symposium (RTSS 2021)
- **TPC -** CPS & IoT Security and Privacy (CPSIoTSec 2020, 2021)

PROFESSIONAL MEMBERSHIP

- Member IEEE
- Member NSBE

INSTITUTIONAL SERVICE

- Broadening Participation Committee
- CSE Faculty Search Committee
- CSE PhD Admissions Committee