

Xinyu HUANG

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EDUCATION

The Hong Kong Polytechnic University

Ph.D. in Networking and Mobile Computing

Hong Kong SAR, China

May 2024 – May 2028 (Expected)

- **Supervisor:** Dr. Yuanqing Zheng
- **Research Topic:** Artificial Intelligence of Things (AIoT), Mobile Computing

University of Electronic Science and Technology of China

B.Eng. in Optoelectronic Information Science and Engineering

Chengdu, China

Sept. 2019 – Jun. 2023

- **GPA: 3.80/4.00, First-Class Honors**
- **Supervisor:** Prof. Yuanming Wu
- **Research Topic:** Security in Internet of Things

PUBLICATIONS

- **Huang, X.**, & Wu, Y., Identify Selective Forwarding Attacks Using Danger Model: Promote the Detection Accuracy in Wireless Sensor Networks. *IEEE Sensors Journal* (*Q1, IF=4.3*), 22(10), 9997-10008.
- **Huang, X.**, Li, S., & Wu, Y., LSTM-NV: A Combined Scheme against Selective Forwarding Attack in Event-Driven Wireless Sensor Networks under Harsh Environments. *Engineering Applications of Artificial Intelligence* (*Q1, IF=8.0*), 2023(123), 106441.
- Wang, H., **Huang, X.**, & Wu, Y., GD3N: Detecting Selective Forwarding Attacks in Wireless Sensor Networks under Variable Harsh Environments. *Information Sciences* (*Q1, IF=8.1*), 2024, 120375.

RESEARCH EXPERIENCE

BLSP Group, The Chinese University of Hong Kong, Shenzhen

Research Topic: Generalized Wireless Localization

Shenzhen, China

Nov. 2022 – Oct. 2023

- Carried out my undergraduate capstone project, realized an indoor wireless localization system based on data-driven models. The localization system utilized the ability of meta-learning and outperformed others in terms of localization accuracy and data generalization. The corresponding research paper has been published in *IEEE Journal on Selected Areas in Communications (JSAC)*.

IoT Group, University of Electronic Science and Technology of China

Research Topic: Security in Internet of Things

Chengdu, China

Oct. 2020 – Jun. 2023

- Detecting selective forwarding attacks in WSNs using **immune danger model**, inspired by human immune system. The work firstly calculated the difference between the predicted values and the real values of sensor nodes utilizing Markov Chains, and then generated five kinds of danger signals within the network. This work has been successfully published in *IEEE Sens. J.*, 2022.
- Combining **LSTM** model with the well-designed neighbor voting mechanism to realize self-adaptive detection of selective forwarding attacks in event-driven wireless sensor networks. The time series model shows powerful ability for handling forwarding rate series of sensor nodes and the neighbor-voting mechanism works well in mobile harsh environments. This work has been successfully published in *Elsevier EAAI*, 2023.
- Simplifying the **DBSCAN clustering** algorithm through the use of data points and optimizes the **neighbor voting** method to achieve highly efficient detection. The GD-DBSCAN technique reduces parameters and accurately clusters nodes, while the double-parameter neighbor voting (DP-NV) method effectively distinguishes between normal and malicious nodes without requiring additional parameters. This work has been submitted to *Elsevier InS* and is currently under 1st review.

WORK EXPERIENCE

Chinasoft Clouds Co., Ltd.

Data Operation and Maintenance Intern

Guiyang, China

Jun. 2021 – Aug. 2022

- Through a collaborative partnership with Guizhou Province's Education Department, we meticulously formulated strategies for data visualization and platform architecture. Employing advanced MySQL tools, we seamlessly imported database content, thereby facilitating users' access to pivotal insights. This operational project has garnered significant commendation from the esteemed Guizhou Province Government.

PROJECTS

Wireless Indoor Localization System Based on Meta-Learning

Capstone Project

- **Outstanding Localization Performance:** This is the first work to harness the potential of meta-learning for wireless localization. Its ability to quickly adapt to environmental changes with computationally inexpensive updates sets it apart from the competition. Furthermore, it achieves this adaptation with just three CSI images per-point in a new environment, solidifying its position as a cost-effective solution.
- **Flexible Model Compatibility:** The work sets its sights on indoor fingerprinting-based localization that leverages both RSS and CSI wireless signal features. Essentially, with its remarkable compatibility, can be utilized with any model that has been trained through gradient descent, and any wireless signal features that can be input into a learning model.

AWARDS & ACHIEVEMENTS

- UESTC **First-Class Honours Graduates**, Jun. 2023
- UESTC Honourable Research (**3/302**), Oct. 2022
- Outstanding Student Scholarship (**top 10%**), Academic year 2020-2021 & 2021-2022
- Chinese Mathematics Modelling Contest, **First Prize**, Oct. 2021
- Chinese Collage Students Mathematics Competition, **Second Prize**, 2020 & 2021
- American Mathematics Modelling Contest (MCM), **Meritorious Winner**, Apr. 2022
- Asia Pacific Mathematics Modelling Contest (APMCM), **Second Prize**, Feb. 2023

SKILLS

Programming: C/C++, Python, MATLAB, LaTeX, MySQL, HTML, Markdown, Verilog, VHDL

Languages: Chinese (native), English (fluent, **IELT 6.5**), Cantonese (fluent)