

# XIANG HUIFANG

Chengdu, Sichuan province, China

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## Education

### Sichuan University

Sep. 2021 – June 2025(Expected)

Bachelor of Engineering, Major: Cyber Science and Engineering, GPA: 3.82/4.0 (13th/162)

Chengdu, Sichuan

## Publications

- [1] **Huifang Xiang**, Ruimei Zhang\*, Ziling Wang, Di Dong. "New results on modeling and hybrid control for malware propagation in cyber-physical systems." Computers & Security. (Under Review)
- [2] **Huifang Xiang**, Junjiang He\*. "An IIoT Malware Propagation Model Considering Device Heterogeneity and Operational Disruptions." DSN'2025. (Under Review)

## Patent

- [1] Ruimei Zhang, **Huifang Xiang**, Ziling Wang, Zhongbo Wang, et al. "A method for constructing and using a malware propagation model", Invention patent, 2024104457359, Substantive examination.

## Research Experience

### Nonlinear Immunodynamics and Malware Propagation Modeling

August 2024 – Present

Advised by Prof. Shui Yu, IEEE Fellow

- Background: Studied nonlinear immunodynamics and reviewed relevant literature on complex networks.
- A malware propagation model with an immunology-based dynamic infection rate is proposed and model stability is demonstrated.

### Malware Propagation Model in IIoT

March 2024 – September

Advised by Prof. Junjiang He

- Background: Developed a malware model combining device heterogeneity and operational disruptions in IIoT.
- Applied stability theory and constructed Lyapunov functions to prove the stability of the model.
- Performed simulations to validate stability and proposed an algorithm to test the model with real-world data. Conducted sensitivity analysis on the basic reproduction number ( $R_0$ ) and the infected nodes, highlighting key parameters influencing the propagation.

### Malware Propagation in Cyber-Physical Systems (CPSs)

September 2023 – July 2024

Advised by Prof. Ruimei Zhang

- Background: Existing studies do not adequately consider the potential for malware to enhance infectivity during propagation.
- Proposed a malware propagation model with different infection rates. Stability theory is applied to prove the asymptotic stability of the equilibrium points and the existence of the Hopf bifurcation is proved.
- A hybrid control method is proposed to control the Hopf bifurcation and simulation is performed using Matlab.

## Scientific Competitions

### 17th National College Student Information Security Contest

July 2024

National Level, Second Prize

- Team member, responsible for the emotion classification module in the intention recognition part of the project.
- Developed backend interfaces using FastAPI, connecting the MySQL database to the frontend. Learned basic React framework and contributed to frontend interface development.

### Undergraduate Training Program for Innovation and Entrepreneurship

May 2024

National Level Project

- Team leader, responsible for creative concepts, theoretical proofs, simulations, and defense, as well as contributing to parts of the proposal.

## Honors & Awards

### Outstanding Graduate (Top 1% in the university)

#### First Prize Scholarship

September 2022-September 2023

#### University-Level Comprehensive Second Prize Scholarship (Top 5%)

September 2021-September 2022

## Skills

- Languages: English (IELTS: 8.0).
- Programming: Matlab, Python, C.