




Xupu Hu

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EDUCATION

- **Nanjing University of Science and Technology (NJUST)**  Sept. 2023 - Apr. 2026
Master of Science in Cybersecurity, advised by [Dr. Ming Zhou](#) and [Prof. Peng Zhang](#). GPA: 87.38 / 100
- **Zhengzhou University (ZZU)**  Sept. 2019 - Jun. 2023
Bachelor of Engineering in Internet of Things (IoT) Engineering. GPA: 3.25 / 4.0 CET - 6

PUBLICATIONS

C = CONFERENCE

- [C.1] Ming Zhou, **Xupu Hu**, Zhihao Wang, Haining Wang, Hui Wen, Limin Sun, Peng Zhang*. [Dynamic Vulnerability Patching for Heterogeneous Embedded Systems Using Stack Frame Reconstruction](#). In the 32nd ACM Conference on Computer and Communications Security (CCS 2025). Accepted (CCF-A, student first author).
 - Analyzed stack frame structures of common embedded MCU architectures; developed stack frame reconstruction for hot patches; extended patch functions to support global variable and macro definition modifications.
 - Achieved control flow redirection via exception mechanisms for heterogeneous embedded systems; selected hot patch triggering strategies based on program storage location.
 - Applied to medical devices, soft PLCs, network services; fixed 102 vulnerabilities across four embedded devices and three MCU architectures.
- [C.2] **Xupu Hu**, Zhongfeng Jin, Tongjie Wei, Peng Zhang, Chonghua Wang, Ming Zhou*. [BluePLP: Dynamic Vulnerability Patching for Heterogeneous BLE Devices](#). International conference on Artificial Intelligence of Things and Systems (AIoTSys 2025). Accepted (AR: 38.9%, 37 out of 95; **Best paper finalists**, 8 out of 37).
 - Leverage hardware breakpoints to support heterogeneous BLE devices, including those based on Cortex-M3, Cortex-M4 and Xtensa LX7 architectures.
 - Use embedded exception handlers to redirect execution flow from vulnerable code to RAM-resident patches, enabling real-time updates without requiring system reboot.
 - Mitigate 25 packet-based vulnerabilities across multiple real-time operating systems and BLE protocol stacks.
- [C.3] Ming Zhou*, Yunjun Ma, **Xupu Hu**, Ran Lin, Qiwen Wang, Weixuan Mao, Chengxiang Si. [Characterizing Network Threats Against Industrial Control Systems Using Honeypot Technology](#). International Conference on Networking and Network Applications (NaNA 2025). Accepted (student second author).
 - A multi-layer ICS honeypot framework that emulates protocol state machines, controller identities, and business workflows.
 - A clean-room state-machine-based controller emulator supporting three network-level PLC honeypots.
 - A tailored threat-analysis capable of identifying malicious IP addresses, exploiting tools, and threat organizations.
 - A global deployment of 51 edge honeypots captured millions of intrusion attempts and suspicious sessions.

*: Corresponding Author.

RESEARCH PROJECTS

PARTIAL LIST

- **Research on Key Technologies for Dynamic Vulnerability Repair of Online PLC Firmware.** Jan. 2025 - Dec. 2027
- National Natural Science Foundation of China (NSFC, 62402225). Participation
- **Security Large Language Model (LLM).** Dec. 2024 - Dec. 2025
- National Project of XXX. Participation
- **Intrusion Deception and Vulnerability Validation Period.** Jan. 2025 - Dec. 2025
- National Information Security Special Project of XXX. Participation

ENGINEERING TECHNOLOGY

PARTIAL LIST

- **Embedded System Development.** Sept. 2019 - Now
 - Tech Stack: C/CPP + Python + Firmware + RTOS + Linux
- **Reverse Engineering.** Sept. 2023 - Now
 - Tech Stack: Ida pro + Bindiff + Ghirda + LLVM + Angr + QEMU + Binwalk...
- **Frontend Web Development.** Jun. 2023 - Apr. 2024
 - Tech Stack: Vite + Vue 3 + Vue Router + Pinia + TypeScript (ts) + Element Plus

OTHER INFORMATION

- **Research Interests** : I specialize in systems and firmware security. During my master's studies, my research focus was on live patching technologies for embedded systems. Additionally, I have a research interest in using Large Language Models (LLMs) to solve traditional challenges in the field of program analysis and to build efficient and intelligent binary program analysis tools. I am building a secure and reliable automated live patching system.
- **Competition Awards** : First Prize in Zhengzhou University Programming Contest, etc.
- **School Honours** : Master's Academic Scholarship, etc.