

SHUAI ZHANG

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Education

The University of New South Wales (UNSW Sydney) Jun 2025—Current | *Sydney, Australia*
Doctor of Philosophy — Electrical Engineering

The University of New South Wales (UNSW Sydney) Jun 2020—Nov 2024 | *Sydney, Australia*
Bachelor of Engineering (Honours) — Telecommunications

- WAM: 80.032
- Graduated with Honours: Class 2 Division 1

Awards

Australia's Global University Award PUCA1026 2020, 2021

- Received the award as a high school graduate with a WACE ATAR exam score above 95.

Research Projects

MUD Conformance Test | *Python, Linux* Dec 2023—Jun 2024

- Developed a comprehensive set of Conformance Test Specifications based on the IETF RFC8520 standard;
- Implemented concrete tests in Python based on the developed specifications to verify the conformance of Internet of Things (IoT) devices to the IETF RFC8520 standard.

Synthesising IoT Network using Formal Models and Specifications May 2023—Apr 2024

The University of New South Wales: Honours Thesis

- Developed a software tool, using Python, Linux and Docker, to construct a network that emulates network activities based on input data models like MUD files;
- Developed a general and extensible schema to describe the network activity of MUD flows for IoT devices;
- Generated synthetic packets and flows between IoT devices and servers based on the input machine-processable specifications like MUD files and MUD activity files.

Network Traffic Visualiser | *Python* May 2023—Aug 2023

The University of New South Wales: Network Performance (TELE4642)

- Emulated a realistic network typology with hosts and servers using Mininet in Python;
- Generated and captured test packets among hosts and servers for further analysis;
- Developed a user-friendly interface for packet visualisation in web browsers to facilitate network diagnosis.

Work Experience

Baishan Cloud Technology Co., Ltd. Aug 2024—Nov 2024

Research and Development Intern Beijing, China

- Developed a Python program that takes traffic captures (PCAPs) as input and visualises key traffic features on a web interface for further analysis by network administrators;
- Researched the feasibility of deploying an open-source Operating System tailored for Software-Defined Networking (SDN) on white-box switches and evaluated its suitability for various application scenarios using network emulation.

The University of New South Wales Dec 2023—May 2024

Part-time Research Assistant Sydney, Australia

- Contributed to a project funded by an industry partner, CNLABS, where I developed a tool and specification for comprehensive conformance testing of IoT devices following the IETF RFC8520 standard;
- Identified a detailed set of specific tests based on the IETF RFC8520 standard and developed corresponding tests to ensure the conformance of IoT devices with this standard.

Research Outputs

- First author of a published paper in ACM CPSIoTSec'25 (Top-tier joint workshop with ACM CCS Conference). **Dec 2025**

S. Zhang, S. Azizi, A. Joshi, G. Batista and H. Habibi Gharakheili, "Towards Behavior Grammar-Driven IoT Network Traffic Generation using MUD Specifications", in Proceedings of the 7th Joint Workshop on CPS&IoT Security and Privacy (Taipei, Taiwan), Oct 2025, doi: 10.1145/3733801.3764203.

- First author of a published paper in IEEE Communications Standards Magazine, Q1-ranked by Scimago. **Mar 2025**

S. Zhang, H. Sullivan, K. K. Lahoti and H. Habibi Gharakheili, "Systematic Verification of IoT Device Conformance to IETF Manufacturer Usage Description Standard", in IEEE Communications Standards Magazine, vol. 9, no. 1, pp. 59-66, March 2025, doi: 10.1109/MCOMSTD.0001.2400051.

Language Skills

- English: IELTS score: 7 | Listening: 7.5; Reading: 7.0; Writing: 6.5; Speaking: 7
- Mandarin: Native

Technological Skills

Programming Languages: Python, C, HTML/CSS, SQL, MATLAB
Frameworks: Linux, GitHub, Flask, Docker, Wireshark, Scapy