

# Bui Duc Manh

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Scholar: <https://scholar.google.com/citations?user=uVkZcmoAAAAJ&hl>

## Education

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### University of Technology Sydney (UTS)

#### **Master of Science (Research) in Computing Science**

**2023 - 2025**

- Researched the topic “Advanced Machine Learning for Privacy-Preserving Intrusion Detection in IoT Networks” under the supervision of [A/Prof Hoang Dinh](#) and A/Prof Diep Nguyen (Conferred in March/2025)
- Specialized knowledge: Privacy-Preserving Deep Learning, Fully Homomorphic Encryption, Federated Learning

### VNU - University of Engineering and Technology (VNU - UET)

#### **Bachelor of Electronic and Communication Engineering**

**2019 - 2023**

- Thesis: Real-time multiple attack detection in the Ethereum 2.0 system (score 9.1/10, evolved in the **list of high-distinction theses** at VNU – University of Engineering and Technology)
- Specialized knowledge: Internet of Things, Blockchain Networks and Machine Learning

## Research Experience

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### [Bio-inspired AI and Robotics Lab \(BioRAI\)](#), NTU, Singapore

#### **Research Associate**

**May/2025 – Present**

- Researching AI reasoning models inspired from neuroscience

### [AI for Mobile Edge Networks Lab \(AI4MEN\)](#), UTS, Australia

#### **Research Assistant**

**May/2024 – May/2025**

- Participated in government-funded projects: “Australia-Vietnam 5G/6G Centre” (Finish in May 2025) and “Intelligent Backscatter Communications for Green and Secure IoT Networks” (Completed)
- Developed a CNN for blockchain bytecode classification (94% Acc.) using **Pytorch**, achieving **award [A1]** in UTS Tech Fest 2024.
- Co-supervised internship student to build a lightweight NLP-inspired MLP for blockchain attack detection using **Tensorflow/Keras** (overseas intern program from Nanyang Technological University)
- Designed a private Proof-of-Stake Blockchain Network using **Go-Ethereum** protocol and **Web3 JS/Python API**, contributing to secure IoT infrastructure

#### **M.Sc. Researcher**

**Sep/2023 – Mar/2025**

- Proposed a novel **DNN-based FHE** for private training/inference on encrypted data, integrating **Pytorch** and **OpenFHE** libraries to achieve 0.01% accuracy gap to non-encryption approach ([J1], [C1])
- Designed and deployed a **federated learning testbed** on encrypted data, optimizing training efficiency by 5× through gRPC-based server configuration and the **Flower** framework (part of [J1])
- Presented conference paper [C1] at IEEE Vehicular Technology Conference (VTC) in Washington DC, USA, October 2024, engaging an international audience.

### [Radio Communication Lab](#), VNU - UET, Vietnam

#### **Undergraduate Student Internship**

**Feb/2022 - Jun/2023**

- Experienced with Wireshark, Hping3, and [BTAT](#) tools for blockchain security experiments
- Developed a multi-modal deep learning method, combining RNN and MLP with a plug-in softmax to jointly process byte-level and network features using **Tensorflow/Keras**, achieving **awards [A2], [A3]**, and a **High-Distinction thesis** at VNU-UET.

## Teaching Experience

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### [Faculty of Engineering and Information Technology](#), UTS

#### **Casual Academic**

**Jan/2024 – May/2025**

- Teaching and designing the Cisco Lab for the IoT Security subject

- Teaching in the Laboratory of Cybersecurity for Mobile Platform subject

## Engineering Experience

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### Viettel High Tech – R&D Department for 5G Network Protocol Software

#### Internship Engineer

May/2022 - Sep/2022

- Experienced with C/C++ to operate on RRC attach procedure between User Equipment and gNodeB, calculated KPI of RRC connection established.

## Awards

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- [A1] UTS Tech Festival 2024 - Cybersecurity Showcase: Macquarie Cloud Services' Best Choice Award
- [A2] 1st prize in undergraduate student research competition in the Faculty of Electronic and Communication Engineering, VNU-UET (March 2023)
- [A3] 2nd prize in undergraduate student research competition at the VNU-University of Engineering and Technology (May 2023)

## Certificates

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- Stanford - Supervised Machine Learning: Regression and Classification
- Cisco IoT Fundamental: IoT Security
- IELTS - International English Language Testing System: 6.5 (2023-2025)

## Publications

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### Journals

- [J1] **B. D. Manh**, C. H. Nguyen, D. T. Hoang, and D. N. Nguyen, "Privacy-Preserving Cyberattack Detection in Blockchain-Based IoT Systems Using AI and Homomorphic Encryption" *IEEE Internet of Things Journal*, Jan 2025, doi: 10.1109/JIOT.2025.3535792. [\[link\]](#) (IF=8.2, Q1, **highest ranked IEEE journal** in IoT).
- [J2] M. A. Hassan, M. B. Jamshidi, **B. D. Manh**, N. H. Chu, C. -H. Nguyen, N. Q. Hieu, C. T. Nguyen, D. T. Hoang, D. N. Nguyen, N. V. Huynh, M. A. Alsheikh and E. Dutkiewicz, "Enabling Technologies for Web 3.0: A Comprehensive Survey" *Elsevier Computer Networks*. [\[preprint\]](#) (IF=4.4, Q1, accepted Mar. 2025).
- [J3] M. A. Hassan, **B. D. Manh**, C. T. Nguyen, C. H. Nguyen, D. T. Hoang, D. N. Nguyen, N. V. Huynh and D. Niyato, "SBW 3.0: A Blockchain-Enabled Framework for Secure and Efficient Information Management in Web 3.0" *IEEE Transactions on Network and Service Management* (major revision).

### Conferences

- [C1] **B. D. Manh**, C.-H. Nguyen, D. T. Hoang, and D. N. Nguyen, "Homomorphic Encryption-Enabled Federated Learning for Privacy-Preserving Intrusion Detection in Resource-Constrained IoV Networks" *IEEE Vehicular Technology Conference (VTC)*, October 2024, Washington DC, USA. [\[link\]](#) (**top-tier conference** in vehicular-related technologies).
- [C2] C.-H. Nguyen, **B. D. Manh**, D. T. Hoang, and D. N. Nguyen, "Towards Secure AI-empowered Vehicular Networks: A Federated Learning Approach using Homomorphic Encryption" *IEEE Vehicular Technology Conference (VTC)*, October 2024, Washington DC, USA. [\[link\]](#)
- [C3] D. H. Son, **B. D. Manh**, T. V. Khoa, N. L. Trung, D. T. Hoang, H. T. Minh, Y. Alem and L. Q. Minh, "Semi-Supervised Learning for Anomaly Detection in Blockchain-based Supply Chains" *IEEE International Symposium on Communications and Information Technologies (ISCIT)*, September 2024, Bangkok, Thailand.

### Book Chapters

- [B1] **B. D. Manh**, N. Q. Hieu, D. T. Hoang, D. N. Nguyen, and E. Hossain "Machine Learning for Cyberattack Detection in Internet of Things Networks: An Overview" *Elsevier Advanced Machine Learning for Cyber-Attack Detection in IoT Networks* (accepted).
- [B2] N. Q. Hieu, **B. D. Manh**, D. T. Hoang, D. N. Nguyen, and E. Hossain "Challenges and Potential Research Directions for Machine Learning-based Cyberattack Detection in IoT Networks" *Elsevier Advanced Machine Learning for Cyber-Attack Detection in IoT Networks* (accepted).