Zikun Zhao

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Education

MSc Information Security *Sep 2024 - Sep 2025*
University College London (UCL) *London, United Kingdom*

- **Expected Degree Class:** 2:1 Degree (64% currently)
- **Key Modules:** Computer Security I&II, Introduction to Cryptography, Research in Information Security, People and Security, Cryptocurrencies, Information Security Management, Privacy Enhancing Technologies.

BSc Computer Science *Sep 2021 - Jun 2024*
Cardiff University *Cardiff, United Kingdom*

- **Degree Class:** 2:1 Degree (68%)
- **Notable Modules:** Web Applications, Problem Solving with Python, Architecture and Operating Systems, Human Computer Interaction, Database Systems, Communication Networks, Object Orientation, Algorithms and Data Structures, etc.

Skills

Languages: Mandarin (Native), English (Fluent)
Programming & Tools:

- **Languages:** Python (Data Analysis, Security Scripting), Java, C++, JavaScript
- **Web Technologies:** HTML, CSS, Vue.js
- **Database:** PostgreSQL, SQL
- **Data Analysis:** Pandas, NumPy, Matplotlib, Jupyter Notebook
- **Machine Learning Libraries:** Hugging Face Transformers Library, PyTorch
- **Security Tools/Concepts:** Wireshark, Cryptography Libraries (OpenSSL), Blockchain Technology, Threat Modeling, Access Control, Security Auditing, Risk Management, Human Factors in Security, Vulnerability Exploitation, Reverse Engineering
- **Version Control:** Git

Academic Research & Projects

Natural Language Processing for Online Moderation *Feb 2024 - May 2024*
Cardiff University (BSc Final Year Project) *United Kingdom*

- Developed a machine learning classifier for automated hate speech detection on social media platforms (e.g., Reddit), leveraging advanced NLP techniques to enhance the integrity of online discourse.
- Utilized and fine-tuned the **ROBERTa model** on a curated dataset, achieving **90.13% accuracy** on validation data, underscoring its proficiency in text classification and generalization potential.
- Implemented comprehensive data preprocessing (normalization, noise removal, tokenization) to ensure data integrity and model effectiveness, considering ethical implications and bias mitigation in AI-driven content moderation systems.
- Designed a user-friendly **Gradio web interface** for real-time text input and classification result visualization, enhancing interpretability.
- Employed **Weights & Biases (W&B)** for real-time performance monitoring and experiment tracking.
- *Technologies:* Python, ROBERTa (Transformer Model), Hugging Face Transformers Library, PyTorch, Pandas, Gradio, Plotly, Google Colab.

Advanced Cryptography & Blockchain Studies *Oct 2024 - Jan 2025*
University College London *United Kingdom*

- **Hash Function Analysis:** Evaluated Merkle-Damgård and Sponge constructions, analyzing collision & length extension attacks and proposing security enhancements. Proved second-preimage resistance for a given function.
- **Blockchain & Privacy Protocols:** Explored Bitcoin's Merkle tree for transaction verification and consensus mechanisms. Investigated Beam's Mimblewimble protocol, Pedersen Commitments, and Dandelion++ for confidential transactions and user anonymity.
- **Digital Signature Security:** Analyzed RSA and Schnorr signature schemes, demonstrating key computations and methods for private key extraction from faulty randomness, highlighting integrity protection.

- **Multisig Wallets & MAC Forgery:** Designed 2-of-3 Multisig wallets for enhanced cryptocurrency security. Constructed a Message Authentication Code (MAC) and proved its Existential Unforgeability (EUF-CMA), directly supporting data integrity.

Practical Cyber Security & Exploitation *Oct 2024 - Jan 2025*
University College London *United Kingdom*

- Engaged in hands-on hacking challenges on the **pwn.college platform**, focusing on **Web Security, Program Interaction, Shellcode Injection, and Memory Error Exploitation** to develop practical vulnerability assessment and exploitation skills relevant to ML system threats.

Human-Centric & Enterprise Security Analysis *Oct 2024 - Jan 2025*
University College London *United Kingdom*

- Conducted usability and security evaluations of Multi-Factor Authentication (MFA) solutions for healthcare settings, applying KLM-GOMS workload estimation and considering human factors.
- Analyzed human error in security incidents and designed behavioral nudges and tailored security awareness strategies. Identified and proposed mitigation strategies for enterprise-level security challenges (e.g., data breaches, supply chain attacks, regulatory compliance, DoS) for an energy company.
- Analyzed smart meter and Home Area Network (HAN) attack vectors, recommending end-to-end encryption and tamper detection for IoT device integrity.

Internship Experience

Project Development Intern *Jul 2023 - Sep 2023*
Xiong An Xiong Chuang Digital Technology Co., Ltd *Hebei, China*

- Contributed to web development projects (HTML, CSS, JavaScript, Vue, PostgreSQL), focusing on page layout, code optimization, and system interface development.
- Responsible for existing system operation, maintenance, software deployment, and identifying data anomalies/errors, ensuring system integrity.
- Assisted in new feature iterative research & development and product performance optimization.

Other Practical Projects

- **Hospital Patient Monitoring System Design:** Utilized Arduino IDE, C++ and IoT components to design a patient monitoring system, enabling remote safety and comfort assurance for patients, with considerations for IoT data security.
- **Unlocking the Future Fit Skills in Generation Z:** Conducted demand analysis, developed and tested a skills training APP (Android Studio), including functional, performance, and security testing.
- **An Analysis on the Specific Data of the QS World Top 200 Universities:** Utilized Pandas, NumPy, Matplotlib, Jupyter Notebook for data analysis, comparison, and visualization of university rankings. Applied t-test and OLS linear regression model for significance testing and data estimation.
- **LBP-based Grayscale Image Quality Assessment Algorithm Development:** Implemented Local Binary Pattern (LBP) algorithm and constructed an automatic Image Quality Assessor (IQA), performing correlation analysis to evaluate its ability to predict real image quality.