WONG WAN KI, THOMAS

PhD Researcher – Cryptography & Machine Learning

CONTACT

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UK (Edinburgh; willing to relocate)
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Availability: Mid-June 2026 onwards (flexible)

SKILLS

Machine Learning/Artificial Intelligence
Python-based Libraries and Frameworks (numpy, pandas, scikit-learn, tensorflow, pytorch, huggingface)
Computer Vision (OCR, human pose detection)
Natural Language Processing (information retrieval, sentiment analysis)
Statistical Testing
MLOps & Deployment

Quantitative Finance
Algorithmic Trading (Crypto & Derivatives)
Strategy Backtesting
Time-Series Analysis

Cryptography & Security
Secure Multi-Party Computation (MPC)
Zero-Knowledge Proofs (ZKPs)
Privacy-Preserving Protocols

Blockchain technologies
Smart Contracts (Solidity, OpenZeppelin ERC721)
Validator setup and Maintenance
DApp Development
Libraries: Ethers.js/Web3

Cloud & DevOps
Docker/Kubernetes
GCP/AWS
Linux

Programming
Python
C/C++
Java/C#
Prolog

Web Development
JavaScript/TypeScript
ReactJS/NodeJS
REST APIs

Languages
Chinese (Cantonese & Mandarin)
English (TOEFL 106/120)

ABOUT ME

I'm a researcher–engineer at the intersection of cryptography and machine learning, pursuing a PhD at the University of Edinburgh designing privacy-preserving protocols for decentralized ML marketplaces using MPC, ZKPs, and smart contracts.
Alongside research, I work at an AI company in Hong Kong shipping end-to-end AI applications: model fine-tuning, MLOps workflows, and production deployments. I turn cutting-edge ideas into robust services.
Beyond work, I'm into quantitative trading, travelling, working out and music.

EDUCATION

10/2023 - 03/2027 (Expected)
University of Edinburgh
Tentative Thesis Topic: Secure Valuation for a Decentralized ML Marketplace

PhD Laboratory for Foundations of Computer Science

09/2022 - 08/2023
University of Edinburgh
Graduated first in class with distinction

MSc Cyber Security, Privacy and Trust

08/2018 - 07/2022
The Chinese University of Hong Kong
ELITE Stream, Minor in Computer Science
First Class Honors
CGPA: 3.72/4.00 (Major GPA 3.90/4.00)

BSc Mathematics and Information Engineering

WORK EXPERIENCE

10/2023 - 04/2024
University of Edinburgh
Developed the ABC autonomous theory-repair system in Prolog for fault detection and correction in logical proofs, applied to use cases like traffic rule adaptation for autonomous vehicles.

Research Assistant

01/2023 - Present
University of Edinburgh
Assisted teaching, labs, and marking for courses in Machine Learning, Security, and Algorithms.

Teaching Support

06/2021 - Present
Datax Limited
Develop AI models and deploy ML pipelines for clients. Projects include computer vision, OCR/NLP tasks, and LLM-based information retrieval.

AI System Engineer

06/2020 - 11/2020
Wilson Acoustics Limited
Enhanced company intranet and warehouse database, automated workflows, and provided IT support.

Full-time Summer Intern (Jun-Jul 2020)
I.T. Technician (Part time)

ACHIEVEMENTS, HONOURS AND AWARDS

- ATCL Piano Diploma, Trinity College (2021)
- HKSAR Government Scholarship (2021/22)
- Dean's List, Faculty of Engineering, CUHK (2019/20,2020/21,2021/22)
- CUHK Honours at Entrance (2018)

RESEARCH EXPERIENCE

PoML: Proof-of-Machine-Learning Consensus for a Decentralized Marketplace **Machine Learning** **Blockchain** Ongoing
-Project objective: To design a consensus mechanism analogous to Bitcoin's Proof-of-Work, where block validity is established by performing machine-learning inference and producing a zero-knowledge proof of correct execution, rather than expending raw computational power.
-Ongoing research towards my PhD.

PrivaDE: Privacy-preserving Data Evaluation for Blockchain-based Data Marketplaces **Machine Learning** **Secure Computation** **Cryptography** 2024 - 2025
https://arxiv.org/abs/2510.18109
-Project objective: To design a cryptographic protocol for privacy-preserving utility scoring and selection of data for machine learning. Leveraging blockchains for malicious-security guarantees and strong privacy protection for both models and datasets.
-Technical Work: Integrated model distillation, model splitting, and cut-and-choose zero-knowledge proofs to achieve practical runtime (<15 minutes on VGG-8 with >4.5M parameters).
-Result: Work accepted and will be presented at ASIACCS 2026, Bangalore, India.

Automating the Theory Repair in First Order Logic **Artificial Intelligence** **Logic programming** 2023
https://www.research.ed.ac.uk/en/publications/automating-theory-repair-in-first-order-logic
-Project objective: To extend the ABC theory repair system (written in Prolog) to a full first-order logic system. (Supervised by Dr. Xue Li and Prof. Alan Bundy)
-Technical Work: Rewritten the fault-detection module and repair-generation module.
-Result: System successfully implemented and results published at CogAI2023.

Towards Practical Automatic Piano Reduction using BERT with Semi-supervised Learning (Final-Year Project)
Music Information Retrieval **Machine Learning** 2021 - 2022
https://tpmmthomas.github.io/ISMIR2022.pdf
-Project objective: To produce a piano reduced version of an orchestral input score automatically with Machine Learning methods. (supervised by Prof. Yip Yuk Lap, Dr. Chuck-Jee Chau & Prof. Irwin King)
-Technical Work: Converted Musical Data into a tokenized format and made use of BERT models to perform the transformation. Other innovative methods such as CycleGAN was also considered and tested.
-Result of the work is submitted to ISMIR 2022 and received weak-reject.

SELECTED PROJECTS/ACTIVITIES

Crypto Quant Research & Backtest **Algorithmic Trading** **Optimization** **REST APIs** 2022 - Now
https://github.com/tpmmthomas/binance-copy-trade-bot / https://github.com/tpmmthomas/cb-bfx-premium-backtest
-Researched and evaluated systematic trading signals (e.g., exchange premiums, order-book imbalance) for crypto markets
-Applied statistical and ML methods (e.g., genetic algorithms, reinforcement learning) for parameter selection and strategy optimization
-Designed an execution-realistic backtesting framework incorporating funding rates, transaction costs, and periodic re-optimization
-Implemented overfitting controls via cross-validation and parameter-robustness analysis
-Developed live-deployed strategies with strong risk-adjusted performance (Sharpe > 2)

AI for Document Retrieval & Understanding **Machine Learning** **LLM** **OCR** 2024 - 2025
-Participated in end-to-end training and development of AI models for document retrieval and understanding.
-Built handwritten Traditional Chinese OCR with dedicated text-detection and text-recognition models (>2M training images).
-Developed sentiment classification system and LLM-powered information retrieval workflows.
-Model selection, benchmarking, and tuning to meet client-specific latency, accuracy, and resource constraints.

Fine-tuning Speech-to-text recognition in Cantonese dataset **Automatic Speech Recognition** **Machine Learning** 2023
https://subanana.com
-Fine-tuned the OpenAI Whisper model with a privately collected Cantonese dataset, to improve model performance on specialized inputs.
-Investigated combination of speech recognition and translation (from spoken to written Cantonese) in a single merged model.

Privacy-preserving AI training hub with the use of blockchain **Blockchain** **Federated Learning** 2021-2022
https://morigin.network
-Contributed to the development of the company in-house product Morigin Network.
-Major deliverables include: 1. Building a DApp on the Oasis network for handling user data exchanges securely and tamper-proof; 2. Modifying the Pysyft/Pygrid/Crypten library to support API calls to the DApp; 3. Writing Smart Contracts with the OpenZeppelin template to be used in the DApp; 4. Propose and train an advertisement matching machine learning model with our modified library integrated with the DApp as a technical POC.