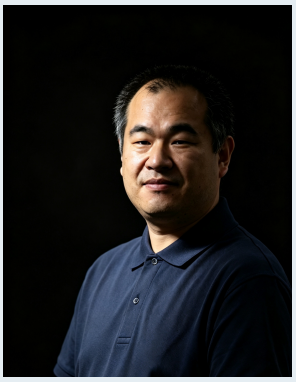

Sean Longyu Ma

PhD

Lecturer in Computer Science

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Research Interests

- FPGA acceleration
- RISC-V customisation
- High-level synthesis
- Heterogeneous computing

Education

PhD in Computer Science
The University of Auckland, 2023

Master of Integrated Circuit Engineering
Shanghai Jiao Tong University, 2016

Bachelor of Communication Engineering
Harbin Engineering University, 2010

Academic Profile

Sean Longyu Ma is a Lecturer in the School of Computer Science at the University of Auckland. His research focuses on FPGA-based computing, RISC-V customisation, high-level synthesis, and heterogeneous computing.

Current Academic Appointment

Lecturer in Computer Science
The University of Auckland

Publications

Efficient FPGA Deployment of Power-of-Two Quantized Networks via Dynamic Hierarchical Base-Exponent Offset Encoding
Zongcheng Yue, Zhihang Liu, **Sean Longyu Ma**, Chiu-Wing Sham
2026 IEEE International Symposium on Circuits and Systems (ISCAS), 4108-4112, 2026
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Adaptive Gradual Quantization with a Custom RISC-V SIMD Accelerator
Zongcheng Yue, Dongwei Yan, **Sean Longyu Ma**, Chiu-Wing Sham
2025 IEEE 18th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC), 2025
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A Review of FPGA-Driven LLM Acceleration
Yulin Fu, Jiale Li, Cheng Cheng, **Sean Longyu Ma**, Chiu-Wing Sham, Nan Zou
2025 IEEE 18th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC), 2025
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Visually meaningful asymmetric image encryption based on a random devil's vortex phase mask in the gyrator transform domain
Yujia Liu, Chiu-Wing Sham, Fuqi Zhang, Hui Zhao, **Sean Longyu Ma**
Optics and Lasers in Engineering, 2025
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FPGA-based real-time image tampering detection system for edge computing
Yulin Fu, Jiale Li, **Sean Longyu Ma**, Chiu-Wing Sham
2025 IEEE 14th Global Conference on Consumer Electronics (GCCE), 2025
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Enhancing Synthesis Efficiency in HLS through LLM-Based Automated Code Correction
Ziyuan Zhang, Yulin Fu, Jiale Li, **Sean Longyu Ma**, Chiu-Wing Sham
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LightFSA: A Lightweight Financial Sentiment Analysis Model
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International Conference on Intelligent Computing, 2025
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LHA: Layer-wise Hardware Acceleration of Progressive Quantizing Inference through Partial Reconfiguration for Edge Computing
Zongcheng Yue, **Sean Longyu Ma**, Chiu-Wing Sham, Chong Fu
2025 International Joint Conference on Neural Networks (IJCNN), 2025
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Joint Post-Training Pruning and Power-of-Two Quantization for Efficient Edge Computing
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A Novel Computing Paradigm for MobileNetV3 using Memristor
Jiale Li, Zhihang Liu, **Sean Longyu Ma**, Chiu-Wing Sham, Chong Fu
2025 International Joint Conference on Neural Networks (IJCNN), 2025
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Target Tracking in Underwater Multi-Sensor Systems using Delayed Bearing-Only Measurements
Shuo Li, Nan Zou, Bin Qi, Guolong Liang, Xiang Li, **Sean Longyu Ma**
IEEE Wireless Communications Letters, 2025
doi:10.1109/LWC.2025.3577659 · source

KernelVM: Teaching Linux Kernel Programming through a Browser-Based Virtual Machine
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Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 1, 2025
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MTST: A Multi-Task Scheduling Transformer Accelerator for Edge Computing
Zongcheng Yue, Dongwei Yan, Ran Wu, **Sean Longyu Ma**, Chiu-Wing Sham
2024 IEEE 13th Global Conference on Consumer Electronics (GCCE), 2024
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An Edge AI System Based on FPGA Platform for Railway Fault Detection
Jiale Li, Yulin Fu, Dongwei Yan, **Sean Longyu Ma**, Chiu-Wing Sham
2024 IEEE 13th Global Conference on Consumer Electronics (GCCE), 2024
doi:10.1109/GCCE62371.2024.10760330 · source

A Mobile Computing-Friendly Stock Price Trend Prediction Model
Zhihang Liu, Chiu-Wing Sham, **Sean Longyu Ma**
2024 IEEE 13th Global Conference on Consumer Electronics (GCCE), 2024
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A Framework for Mapping Convolutional Neural Network onto Memristor Crossbars
Jiale Li, Yulin Fu, Chiu-Wing Sham, **Sean Longyu Ma**
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ViT-LOB: Efficient Vision Transformer for StockPrice Trend Prediction Using Limit Order Books
Zhihang Liu, Chiu-Wing Sham, **Sean Longyu Ma**, Chong Fu
2024 10th International Conference on Applied System Innovation (ICASI), 2024
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PQDE: Comprehensive Progressive Quantization with Discretization Error for Ultra-Low Bitrate MobileNet towards Low-Resolution Imagery
Zongcheng Yue, Ran Wu, **Sean Longyu Ma**, Chong Fu, Chiu-Wing Sham
2024 IEEE 6th International Conference on AI Circuits and Systems (AICAS), 2024
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Urban Aquatic Scene Expansion for Semantic Segmentation in Cityscapes
Z Yue, C-Y Lo, R Wu, **Sean Longyu Ma**, C-W Sham
MDPI, 2024
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Early-Stopped Technique for BCH Decoding Algorithm Under Tolerant Fault Probability
Shih-Shuan Wang, Hong-fu Chou, Xinchao Zhong, **Sean Longyu Ma**
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Joint Source-Channel Coding System for 6G Communication: Design, Prototype and Future Directions
Xinchao Zhong, Chiu-Wing Sham, **Sean Longyu Ma**, Hong-Fu Chou, Arsham Mostaani, Thang X. Vu, Symeon Chatzinotas
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Implementation for JSCC Scheme Based on QC-LDPC Codes
Sean Longyu Ma, Chiu Wing Sham, Jia Zhan, Francis CM Lau
2022 IEEE 11th Global Conference on Consumer Electronics (GCCE), 2022
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An effective multi-mode iris authentication system on a microprocessor-FPGA heterogeneous platform with QC-LDPC codes
Sean Longyu Ma, Chiu-Wing Sham, Chun Yan Lo, Xinchao Zhong
IEEE Access, 2021
source

CNN Accelerator with Non-Blocking Network Design
Chun Yan Lo, **Sean Longyu Ma**, Chiu-Wing Sham
2021 IEEE 10th Global Conference on Consumer Electronics (GCCE), 2021
source

A highly integrated RISC-V based SoC for on-board unit in ETC system
Xinchao Zhong, Chiu-Wing Sham, **Sean Longyu Ma**
2021 IEEE 10th Global Conference on Consumer Electronics (GCCE), 2021
source

A dynamically reconfigurable QC-LDPC implementation for iris recognition
Sean Longyu Ma, Chiu Wing Sham, Chun Yan Lo, Xinchao Zhong
2021 IEEE 10th Global Conference on Consumer Electronics (GCCE), 2021
source

A RISC-V SoC for mobile payment based on visible light communication
Xinchao Zhong, Chiu-Wing Sham, **Sean Longyu Ma**
2020 IEEE Asia Pacific Conference on Circuits and Systems (APCCAS), 2020
source

An iris recognition system implementation with error correction capability by reusing WiFi standard LDPC codes
Sean Longyu Ma, Xinchao Zhong, Chiu Wing Sham, Chun Yan Lo
2020 IEEE 9th Global Conference on Consumer Electronics (GCCE), 2020
source

A Novel Iris Verification Framework Using Machine Learning algorithm on Embedded Systems
Chun Yan Lo, Chiu-Wing Sham, **Sean Longyu Ma**
2020 IEEE 9th Global Conference on Consumer Electronics (GCCE), 2020
source

Iris recognition system implementation improved by QC-LDPC codes
Sean Longyu Ma, Chiu Wing Sham
2020 IEEE 2nd Global Conference on Life Sciences and Technologies (LifeTech), 2020
source

SoC-FPGA-based implementation of iris recognition enhanced by QC-LDPC codes
Sean Longyu Ma, Chiu-Wing Sham
2019 International Conference on Field-Programmable Technology (ICFPT), 2019
source

A real-time flexible telecommunication decoding architecture using FPGA partial reconfiguration
Sean Longyu Ma, Chiu-Wing Sham, Jing Sun, Raul Valencia Tenorio
IEEE Transactions on Circuits and Systems II: Express Briefs, 2019
source

A novel data packing technique for QC-LDPC decoder architecture applied to NAND flash controller
Sean Longyu Ma, Hong-Fu Chou, Chiu-Wing Sham
2019 IEEE 8th Global Conference on Consumer Electronics (GCCE), 2019
source

Optimized layer architecture for layered LDPC code decoder
Sean Longyu Ma, Chiu Wing Sham
2018 International Conference on Advanced Technologies for Communications (ATC), 2018
source

Invited Talks & Presentations

2026 IEEE International Symposium on Circuits and Systems
2026 IEEE International Symposium on Circuits and Systems
Shanghai International Converntion Center, Shanghai, China, 27 May 2026

Technical Talks of IEEE Consumer Technoligy Society - 19th Webinar
Technical Talks of IEEE Consumer Technoligy Society - 19th Webinar
Online, Online, 23 January 2026

IEEE CASS Workshop: Circuit-Level Intelligence: From Secure Silicon to AI-Ready Systems
IEEE CASS Workshop: Circuit-Level Intelligence: From Secure Silicon to AI-Ready Systems
Nanyang Technological University, Singapore, 18 December 2025

Interal Talk with staff in Computer Science, UoA
Interal Talk with staff in Computer Science, UoA
University of Auckland, Auckland, New Zealand, 08 August 2025

Journey to the “South”: Advancing Computing from Traditional Architectures to Emerging Technologies
Journey to the “South”: Advancing Computing from Traditional Architectures to Emerging Technologies
Room 408 微电子楼, Shanghai Jiao Tong University, 08 November 2024

Joint 6G-PHYSEC & INTERACT Workshop on 6G Technologies and PHY Layer Security
Joint 6G-PHYSEC & INTERACT Workshop on 6G Technologies and PHY Layer Security
Aalto University, Helsinki, Finland, 17 June 2024

WebVM - an innovative approach to teaching OS concepts
WebVM - an innovative approach to teaching OS concepts
The University of Auckland, Auckland, NZ, 14 June 2024

Teaching

UoA Undergraduate Teaching experience
Undergraduate course, The University of Auckland, School of Computer Science, Auckland, New Zealand
COMPSCI 110 Introduction to Computer Systems (2024S2)
COMPSCI 315 Data Communications Technologies (2024S2)
COMPSCI 215 Data Communication (2024S1)
SOFTENG 370 Operating System (2024S1)
COMPSCI 340 Operating System (2023S2)