International Conference on Blockchain Research and Applications

BCRA 2025

10-11 August 2025 | Hong Kong, China

Conference Program

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人工智能物聯網研究院 Research Institute for Artificial Intelligence of Things

Co-organizers

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International Conference on Blockchain Research and Applications (BCRA 2025)

10-11 August
Hong Kong, China

Conference Program

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Program at a Glance

Time	Sunday, 10 August 2025 (Day 1)	
09:00-12:00	**Registration** *TU107, PolyU*	
14:00-15:00	**Paper Presentation Session 1** **Blockchain Data Management** *Room TU107, PolyU*	**Paper Presentation Session 2** **Blockchain Consensus** *Room TU103, PolyU*
15:00-15:20	Coffee Break	
15:20-16:20	**Paper Presentation Session 3** **Blockchain and Cryptocurrencies** *Room TU107, PolyU*	**Paper Presentation Session 4** **Blockchain Security and Privacy** *Room TU103, PolyU*
17:00-19:00	**Conference Reception** *Function Room 5 and 6, Basement 1, Hotel ICON* *(17 Science Museum Road Tsim Sha Tsui East, Kowloon)*	
Time	**Monday, 11 August 2025 (Day 2)**	
08:30-09:00	**Registration** *TU107, PolyU*	
09:00-09:30	**Opening Remarks** *Room TU107, PolyU*	
09:30-10:30	**Keynote** ***Redbelly Network*** by Prof. Vincent Gramoli, University of Sydney & Redbelly Network *Room TU107, PolyU*	
10:30-10:50	Coffee Break	
10:50-11:50	**Panel Discussion** ***Web3 Stablecoins: Current and The Future*** *Room TU107, PolyU*	
11:50-14:00	**Lunch** *Ju Yin House (4/F., Communal Building, PolyU)*	
14:00-16:00	**International Workshop on Blockchain and Web3.0 (BWEB3 2025)** *Room TU107, PolyU*	**International Workshop on The Fusion of Artificial Intelligence and Stablecoins (AISC)** *Room TU103, PolyU*
16:00-16:20	Coffee Break	
16:20-17:40	**International Workshop on Blockchain and Financial Intelligence (BFI 2025)** *Room TU107, PolyU*	
18:00-21:00	**Conference Banquet** *Hung Kee Seafood Restaurant* *(Shop 6 & 9-10, G/F, Siu Yat Building, 1 Sai Kung Hoi Pong Square, Sai Kung)* Transportation will be arranged to the conference banquet. Please arrive at G/F., Communal Building (Core S), PolyU by 18:00.	

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Keynote

Redbelly Network

Vincent Gramoli
University of Sydney & Redbelly Network
Australia

Monday, 11 August 2025 | 09:30 – 10:30
Room TU107, PolyU

Abstract
Redbelly Network represents a new paradigm in blockchain technology, delivering unprecedented levels of scalability, decentralisation and security. In this keynote, we will present the series of research results combining game theory, distributed computing, software systems and formal verification that were necessary to design the first public blockchain used by a central bank. Through various benchmarking experiments we will demonstrate the properties of determinism, Byzantine fault tolerance, instant finality and fairness that make Redbelly Network the solution of choice to tokenize real world assets.

Biography
Vincent Gramoli is the Founder and CTO of Redbelly Network and a Professor of Computer Science at the University of Sydney. He received the Digital National Facilities & Collections Award from CSIRO, the Education Leader of the Year Award from Blockchain Australia, and the Future Fellowship from the Australian Research Council. In the past, Gramoli has been affiliated with INRIA, Cornell, Data61 and EPFL. Vincent is part of the Editorial Board of the Journal of Parallel and Distributed Computing and is a Director of Redbelly Network. In the past, Vincent acted as the Chair of the Cybersecurity Committee for CORE, the Chair of the Blockchain Technical Committee for the ACS, an advisor and a Blockchain expert for central and commercial banks. His expertise is in distributed computing and security. With his lab, he found and reported security vulnerabilities in blockchains in 2016, 2017, 2019 and 2024. As an alternative, they proposed the Redbelly Blockchain that offers quasi-instant finality, is Solidity compatible and scales to large networks. They designed a realistic open source blockchain benchmark suite, called Diablo. Vincent teaches Distributed Systems at the University of Sydney, the Coursera Blockchain Scalability MOOC to 13K students and published the textbook with Springer.

Panel Discussion

Web3 Stablecoins: Current and The Future

Monday, 11 August 2025 | 10:50 – 11:50
Room TU107, PolyU

Abstract

The 2025 wave of global monetary tightening, the collapse of several algorithmic tokens, and the rapid maturation of central-bank digital-currency (CBDC) pilots have catapulted stablecoins to the centre of the Web3 conversation. Once viewed merely as a convenient on-ramp between fiat and volatile crypto-assets, stablecoins now settle more than US 12 trillion in annual on-chain volume—rivalling Visa—and underpin every major decentralised-finance (DeFi) protocol. Their governance, collateral quality, regulatory treatment and technological design have become decisive variables for the resilience of the entire Web3 stack.

"Web3 Stablecoins: Current and The Future" brings together regulators, protocol economists, cryptographers and end-user representatives to interrogate the next decade of programmable money. The session is structured as a 60-minute panel. Key questions guiding the discussion include but are not limited to:

- Collateral & Transparency: How will on-chain attestations evolve in a post-FTX world, and can zero-knowledge proofs replace traditional audits without sacrificing disclosure?
- Algorithmic vs. Asset-Backed: Is the algorithmic model permanently discredited, or will new feedback-control mechanisms (e.g., RAI-style PID controllers) revive it?
- Regulatory Convergence: Will the EU's MiCAR, the U.S. STABLE Act and Hong Kong's new licensing regime converge on a single "passportable" global standard?
- Programmable Utility: Can stablecoins remain censorship-resistant while integrating compliance logic (travel rule, sanctions screening) at the protocol layer?
- Macro-Systemic Risk: If 10 % of emerging-market M2 migrates to USD-backed stablecoins, what are the spill-overs for domestic monetary sovereignty and capital-flow volatility?
- Future Design Space: How might non-USD stablecoins (e.g., XSGD, EURC) and CBDC "sandboxes" reshape the multi-currency Web3 economy?

Moderator

Bin Xiao
The Hong Kong Polytechnic University
China

Panelists

Ramesh Ramadoss
IEEE Blockchain Technical Community
USA

Chunming Rong
University of Stavanger
Norway

Xiaohu Yang
Zhejiang University
China

Ramesh Ramadoss
IEEE Blockchain Technical Community, USA

Biography
Ramesh Ramadoss is an entrepreneur, researcher, author, and international speaker. He earned his Doctor of Philosophy (Ph.D.) in Electrical Engineering from the University of Colorado at Boulder, USA. Currently, he serves as Chair of the IEEE Blockchain Technical Community and has spearheaded the establishment of over 80 IEEE Blockchain Local Groups worldwide. In 2024, his biography was included in Marquis Who's Who in America for his notable contributions to engineering. He received the 2024 Distinguished Leadership Award from the IEEE TEMS Technical Committee on Blockchain and Distributed Ledger Technologies.

He is the author or co-author of one book, four chapters, and more than 50 research papers. He has written the foreword for three books in the blockchain field. He has also delivered talks at over 200 international conferences across 80 countries. He has about five years of academic experience at Auburn University, during which he conducted projects for DARPA, NASA, the U.S. Army, the U.S. Air Force, Sandia National Labs, and Motorola Labs.

Additionally, he has over 15 years of industry experience in Silicon Valley as a Technical Leader, Co-Founder, and Advisor.

He is a Senior Member of IEEE. In 2016 and 2017, he served as Vice Chair and Chair, respectively, of the IEEE Santa Clara Valley Section, based in Silicon Valley. In 2018, he co-founded the IEEE Blockchain Initiative and served as its Co-Chair from 2018 to 2022. In 2019, he served as a convener at the Enterprise Ethereum Alliance (EEA). In 2020, he co-founded the InterWork Alliance (IWA), now part of the Global Blockchain Business Council (GBBC). From 2021 to 2024, he served as an Expert Panel Member of the European Union Blockchain Observatory and Forum (EUBOF). From 2022 to 2024, he was a member of the Board of Governors of the IEEE Standards Association.

Chunming Rong
University of Stavanger, Norway

Biography

Prof. Chunming Rong has been academician of the Norwegian Academy of Technological Sciences (NTVA) since 2011. He has served the extended IEEE Cloud Computing community for many years. Starting the CloudCom conference series in 2009, he gave numerous keynote addresses at IEEE conferences all over the world. He played a vital leadership role (first as vice chair and then as chair) in both the IEEE Cloud Computing initiative and the IEEE CS STC Cloud Computing, and led its transition to the IEEE CS Technical Committee on Cloud Computing (TCCLD). He served as the steering chair (2016-2019), and now as steering member of the IEEE Transactions on Cloud Computing (TCC). He has extended his engagement also in the IEEE Future Directions, through his involvement with the IEEE Blockchain Initiative (2017-2018). He is an executive member of Technical Consortium on High Performance Computing (TCHPC) and the chair of STC on Blockchain in IEEE Computer Society. He is an IEEE senior member. Prof. Rong is also advisor of the StandICT.EU to support European scandalization activities in ICT. He works as the head of the Data-centered and Secure Computing (DSComputing) at the University of Stavanger (UiS). He is also co-founder of two start-ups bitYoga and Dataunitor in Norway, both received EU Seal of Excellence Award in 2018. He was adjunct Senior Scientist leading Big-Data Initiative at NORCE (2016-2019), the vice president of CSA Norway Chapter (2016-2017). He is co-Editors-in-Chief of the journal “Blockchain: Research and Applications” by Elsevier, co-Editors-in-Chief of the Journal of Cloud Computing (ISSN: 2192-113X) by Springer, has served as the steering chair (2016-2019), steering member and associate editor of the IEEE Transactions on Cloud Computing (TCC) since 2016. He has extensive contact network and projects in both the industry and academic. His research work focuses on cloud computing, data analytics, cyber security and blockchain. Prof. Rong has extensive experience in managing large-scale R&D projects, both in Norway and EU.

Xiaohu Yang
Zhejiang University, China

Biography

Xiaohu Yang is a professor at College of Computer Science & Technology, Zhejiang University. He is the Director of Blockchain Research Center and Vice Director of Computer Software Institute at Zhejiang University, and an Adjunct Professor of Shanghai Institute for Advanced Study of Zhejiang University (SIAS).

He is the co-founder of State Street Zhejiang University Technology Center, a joint research center set up in 2001 by State Street Corp. and Zhejiang University, for advanced research and development of global financial software systems and technologies. Since then, he has been leading the Technology Center, and brought it up from 15 people to more than a thousand people up-to-date.

His research interests include software engineering, blockchain, and cloud computing. He received his BS degree, the MS degree and the PhD degree all in computer science at Zhejiang University in 1988, 1990, and 1993 respectively.

International Workshop on Blockchain and Web3.0 (BWEB3 2025)

Monday, 11 August 2025 | 14:00 – 16:00
Room TU107, PolyU

Workshop Introduction

The emergence of blockchain technology has catalysed a paradigm shift in how digital systems are designed, governed, and experienced. As we move toward the era of Web3.0—a decentralized, user-centric evolution of the internet—blockchain stands as a foundational pillar, enabling trustless interactions, programmable value exchange, and new forms of digital ownership. This workshop aims to bring together researchers, practitioners, and industry leaders to explore the latest advancements, challenges, and opportunities at the intersection of blockchain and the rapidly evolving Web3.0 landscape.

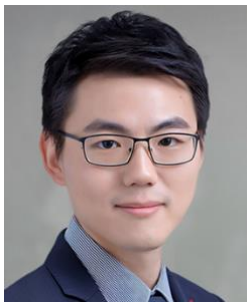
Web3.0 envisions an internet where users regain sovereignty over their data, identities, and digital assets, powered by decentralized protocols and interoperable networks. Blockchain technologies, with their inherent transparency, immutability, and programmability, are central to realizing this vision. From decentralized finance (DeFi) and non-fungible tokens (NFTs) to decentralized autonomous organizations (DAOs) and decentralized identity (DID) systems, the convergence of blockchain and Web3.0 is unlocking unprecedented possibilities for innovation across industries.

This workshop seeks to address critical questions: How can blockchain protocols be scaled and optimized to support the demands of Web3.0 applications? What are the emerging patterns for decentralized governance, data privacy, and interoperability in Web3.0 ecosystems? How can smart contracts, tokenization, and decentralized storage reshape digital economies and social networks? What are the ethical, regulatory, and sustainability considerations as blockchain and Web3.0 technologies mature?

Organization Chairs

- Zhe Peng, The Hong Kong Polytechnic University, China
- Bin Xiao, The Hong Kong Polytechnic University, China

Session Chairs



Zhe Peng
The Hong Kong Polytechnic University
China

Bin Xiao
The Hong Kong Polytechnic University
China

Speakers

Xiuzhen Cheng
Shandong University
China

Qiang Qu
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences
China

Yi Sun
Institute of Computing Technology, Chinese Academy of Sciences
China

Cong Wang
City University of Hong Kong
China

Xiuzhen Cheng
Shandong University, China

Title: Blockchain for Data Security: Consensus, Storage, and Interoperability

Abstract
Blockchain technologies offer powerful tools for building robust, tamper-resistant, and decentralized data infrastructures. As data security faces mounting challenges in complex, heterogeneous, and distributed network environments, blockchain is emerging as a promising foundation for ensuring confidentiality, integrity, and availability. In this talk, we present a set of solutions that leverage blockchain to address modern data security challenges. First, we design wireless consensus protocols that remain robust under adversarial signal interference, enabling secure agreement in complex communication environments. Second, we develop decentralized storage systems that are scalable, succinct, and Byzantine-resilient, ensuring secure and efficient data sharing across untrusted nodes. Third, we introduce cross-chain interoperability frameworks that enable atomic, fair, and

privacy-preserving data exchanges across heterogeneous blockchain ecosystems. These efforts demonstrate how blockchain technologies can be systematically applied to enhance data security across a range of environments and applications.

Biography

Xiuzhen Cheng is a Professor of Computer Science at Shandong University. Before August 2020, she was a tenured faculty member at The George Washington University, USA. Her research focuses on the broad area of blockchain computing, responsible AI, security and privacy, and edge intelligence. Prof. Cheng is the founder and steering committee chair of the International Conference on Wireless Artificial Intelligent Computing Systems and Applications (WASA, launched in 2006), and the founding EiC of the High-Confidence Computing Journal (launched in 2021). She served/is serving on the editorial boards of several technical journals and the technical program committees of many professional conferences/workshops. She also chaired several international conferences. Prof. Cheng is a Fellow of IEEE, a Fellow of CSEE (Chinese Society for Electrical Engineering), and a Fellow of AAIA (Asia-Pacific Artificial Intelligence Association). Her current H-Index is 72, and the total number of Google Citations is 23K+.

Qiang Qu
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

Title: Web3 Assets Reimagined: Reconstructing the Landscape of Asset Integration and Decentralized Trading

Abstract

Recent advancements in Web3 are fundamentally changing the landscape of digital assets. This calls for a critical reexamination and reconstruction of how assets are integrated and how decentralized trading operates. This keynote will explore the important connections between established digital currencies, real-world asset tokenization, and the intersections of emerging technologies. It will also address challenges and research directions that traditional blockchain-based trading methods cannot adequately handle. The presentation aims to inspire innovative research into a restructured Web3 asset ecosystem, highlighting unexplored opportunities for better integration, decentralization, and advanced trading solutions.

Biography

Qiang Qu is a full professor at Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences. He is currently the director of Guangdong Provincial Blockchain and Distributed IOT Security Engineering Research Center, and the deputy director of Shenzhen Key Laboratory on High-performance Data Mining. He is a senior member of the China Computer Federation. Qu received his PhD from Aarhus University supervised by Obel Professor Christian S. Jensen in 2014. He has working experiences from Innopolis University, Carnegie Mellon University, ETH Zurich and Singapore Management University. His research endeavors focus on blockchain/Web3 technologies, databases, data mining, and advanced data intelligence systems. He joined Chinese Academy of Sciences at the end of 2016, and he was promoted to a full professor in 2020. He has been a principal investigator (PI) for a

number of projects, and he is now the chief scientist for a project supported by National key research and development program of China.

Yi Sun
Institute of Computing Technology, Chinese Academy of Sciences, China

Title: Parallelization Technologies in Blockchain

Abstract
Performance is one of the key bottlenecks hindering the large-scale adoption of blockchain systems. Parallelization has served as a critical technical approach to effectively enhance blockchain performance. However, the inherent characteristics of blockchain systems pose significant challenges to facilitate parallelization. This presentation will explore several parallelization technologies to improve blockchain performance, drawing from collaborative experiences with major blockchain platforms, and provide insights into the future development of parallelization technologies.

Biography
Prof. Yi Sun is a professor in the Institute of Computing Technology, Chinese Academy of Sciences, a member of the CCF Blockchain Technical Committee, a member of the Expert Group for Key R&D Programs under the Ministry of Science and Technology of China. His research focuses on Blockchain, Trusted Data Circulation, and Distributed Applications. He has published over 100 academic papers, held 70+ authorized patents, and participated in the formulation of more than 10 international/national standards. He received two province or ministry level First Prizes of Science and Technology Progress Award.

Cong Wang
City University of Hong Kong, China

Title: Web3 Data Security and Privacy

Biography
Prof. Cong Wang is a Professor in the Department of Computer Science, City University of Hong Kong. He serves/has served as the Editor-in-Chief for IEEE Transactions on Dependable and Secure Computing, associate editors for IEEE Transactions on Services Computing, IEEE Internet of Things Journal, IEEE Networking Letters, Journal of Blockchain Research, and TPC co-chairs for a number of IEEE conferences and workshops. He is a fellow of the IEEE and a member of the ACM. Prof. Wang is interested in developing secure software systems with theoretical security / privacy guarantee and practical performance. His recent work has focused on data security (e.g., encrypted databases, multi-party encrypted analytics, proofs of remote storage, etc.), AI systems and security (e.g., red teaming for LLM, federated (un)learning, robust reinforcement learning, etc.), privacy-enhancing technologies (e.g., encrypted messaging and metadata privacy, anonymous communications, encrypted network middleboxes, etc.), blockchain and decentralised applications (e.g., decentralized storage auditing, on-chain/off-chain interoperability, consensus designs, etc.), and software security and systems (e.g., hardware-assisted security, anti-fuzzing techniques, boosting performance of deep learning clusters, etc.).

International Workshop on The Fusion of Artificial Intelligence and Stablecoins (AISC)

Monday, 11 August 2025 | 14:00 – 16:00
Room TU103, PolyU

Workshop Introduction

Stablecoins have become the quiet backbone of digital commerce, moving hundreds of billions of dollars with near-zero volatility. Yet their promise—frictionless, programmable, borderless value—remains only half-realized. Settlement speed, regulatory compliance, capital efficiency, and user trust still hinge on decisions made by human operators peering at dashboards. Meanwhile, artificial intelligence has evolved from pattern-recognition to autonomous, real-time optimization of complex systems. The next leap in monetary infrastructure will not come from faster blockchains alone, but from the deep fusion of AI with the monetary layer itself.

The AISC workshop convenes researchers, protocol engineers, monetary economists, and policy makers to ask one question: What becomes possible when stablecoins can sense, reason, and act without human latency? This workshop will

- Map the frontier – survey state-of-the-art AI techniques (reinforcement learning, formal verification, privacy-preserving federated models) already being deployed or proposed for stablecoin reserve management, on-chain risk engines, and cross-chain liquidity routing.
- Re-imagine risk – explore how AI can compress credit, liquidity, and de-peg risk into continuously updated probability surfaces, enabling dynamic collateral haircuts, adaptive interest rates, and AI-governed circuit breakers.
- Re-design compliance – prototype zero-knowledge AI agents that monitor sanctions, AML, and consumer-protection rules in real time while shielding user privacy, turning compliance from a checkpoint into an embedded protocol feature.
- Re-engineer trust – debate the governance paradox: Can an autonomous stablecoin remain decentralized if its AI modules are opaque? We will workshop new frameworks for transparent, auditable machine-learning oracles and “explainable monetary policy.”
- Re-architect policy – co-draft regulatory sandboxes and model statutes with representatives from the BIS, MAS, OCC, and the European Commission, translating technical breakthroughs into actionable supervisory guidance.

Organizers

International Workshop on Blockchain and Financial Intelligence (BFI 2025)

Monday, 11 August 2025 | 16:20 – 17:40
Room TU107, PolyU

Workshop Introduction

Blockchain technology, combined with advances in artificial intelligence (AI) and large language models (LLMs), is dramatically reshaping the financial landscape. This convergence is powering new decentralized financial ecosystems (DeFi), enhancing transaction transparency, optimizing financial risk management, and enabling novel regulatory approaches. This workshop aims to investigate the dynamic relationship between blockchain, AI-driven financial analytics, decentralized finance (DeFi), and large-scale generative models, emphasizing their potential to revolutionize traditional finance and emerging fintech solutions within the Web 3.0 paradigm.

The financial industry is increasingly leveraging blockchain to achieve decentralization, transparency, and immutable transaction records. Concurrently, AI and sophisticated large-scale models (such as ChatGPT and BloombergGPT) are enhancing decision-making, fraud detection, credit scoring, and predictive analytics. Web 3.0 frameworks amplify these advances by prioritizing interoperability, decentralized governance, and enhanced user empowerment, presenting new opportunities and challenges for financial technologies.

This workshop seeks to address critical questions: How can blockchain and AI models synergize to foster transparency, security, and fairness in financial systems? How can large generative models augment DeFi protocols, risk management, and automated financial advisory services? What strategies and frameworks can effectively mitigate security vulnerabilities, privacy concerns, and regulatory complexities within blockchain-based financial systems?

Organization Chairs

- Guanjie Cheng, Zhejiang University, China
- Junqin Huang, Shanghai Jiao Tong University, China
- Shangrong Jiang, The University of Hong Kong, China

Session Chair

Guanjie Cheng
Zhejiang University
China

Speakers

Weimin Chen
The Hong Kong Polytechnic University
China

Butian Huang
Yunphant
China

Huawei Huang
Sun Yat-sen University
China

Junqin Huang
Shanghai Jiao Tong University
China

Shangrong Jiang
The University of Hong Kong
China

Weimin Chen
The Hong Kong Polytechnic University, China

Title: Towards Smart Contract Fuzzing on GPUs

Abstract
Smart contracts are decentralized applications that manage digital assets such as Ether and ERC tokens. They are the core infrastructure of blockchain ecosystems, particularly in decentralized finance (DeFi). However, smart contracts has also led to a surge in security incidents, resulting in billions of dollars in financial losses due to exploitable vulnerabilities. Fuzzing is one of the primary techniques for uncovering such vulnerabilities. In an empirical study of state-of-the-art fuzzers, we found that their effectiveness is severely constrained by low throughput. This limitation stems from several factors: the inherently slow execution of the EVM, delays introduced by consensus protocols, limited parallelism on CPUs, and the significant overhead imposed by instrumentation. In this talk, I will present our research on fuzzing-based vulnerability analysis, with a particular focus on GPU-accelerated fuzzing. Unlike traditional CPU-based approaches, our system rewrites smart contract bytecode into PTX code for execution on GPUs, enabling massively parallel testing across thousands of cores. This architecture substantially increases throughput and accelerates the detection of hidden bugs. To address the technical challenges of parallel fuzzing, we propose: (1) an

incremental storage design to minimize GPU memory overhead, (2) a stateful bitmap to encode transaction dependencies into the feedback metric, and (3) a parallel feedback algorithm to efficiently eliminate redundant seed inputs. We implement these techniques in a prototype system, MAU, and evaluate it on both small and large benchmark suites. The results demonstrate huge performance gains in throughput and bug detection capability, showcasing the promise of GPU-accelerated fuzzing for smart contract security.

Biography
Weimin Chen is currently a PhD Candidate in the Research Centre for Blockchain Technology (RCBT) at Hong Kong Polytechnic University, under the supervision of Prof. Xiapu Luo. Before that, Weimin Chen received his B.S. from BUPT in 2021, where he was the research assistant of Prof. Haoyu Wang. His research interests span blockchain security, especially smart contract security, fuzzing technology, and binary translation. Recently, he has been particular interested in the GPU-based smart contracts, aiming to run multiple smart contracts together on GPU for higher throughout. He has public a series of paper in prestigious international conferences such as IEEE S&P, ISSTA, SIGMATRIC, ICSE, ASE, and LCTES. He is also a reviewer for multiple international journals and conferences such as IEEE TDSC, ToN, TOSEM, IoT, and SecureComm.

Butian Huang
Yunphant, China

Title: New financial infrastructure based on blockchain

Abstract
The new financial infrastructure based on blockchain is profoundly reshaping the traditional financial system, achieving leaps in efficiency, security, and inclusiveness through distributed ledgers, smart contracts, cross-chain technology, and more. Important national financial market infrastructure institutions are applying blockchain, privacy computing, and other technologies to build new financial infrastructures such as multilateral currency bridges, digital bonds, digital warehouse receipts, and foreign exchange settlements. Meanwhile, internationally, a global cross-border payment network based on stable coins has already taken shape, with stable coins becoming the on-chain cash foundation for RWA transactions. RWA is the physical extension of stable coin application scenarios. Blockchain will reshape financial efficiency and boundaries, becoming the core foundation of the digital economy.

Biography
Founder and Chairman of Yunphant, Doctor of Computer Science from Zhejiang University, National Leading Talent, Professor at Hangzhou Dianzi University, Deputy Director of the Digital Economy Special Committee of the Zhejiang Provincial Committee of the Jiu San Society, Standing Committee Member of the CCF Blockchain Special Committee, Standing Committee Member of the CCF Digital Finance Branch, Initiator and Vice President of the Zhejiang Blockchain Technology Application Association, Vice Chairman of the Hangzhou Future Technology Kunpeng Enterprise Alliance, one of the main drafters of the financial distributed ledger standard of the People's Bank of China, head of the leading unit for the blockchain key special project of the National Key R&D Program, project leader for the

future industry innovation task announcement project of the Ministry of Industry and Information Technology, and project leader for the innovation consortium project of the Zhejiang Provincial Pioneer Technology Plan.

Huawei Huang
Sun Yat-sen University, China

Title: BrokerChain Testnet: How we design and What we have learned

Abstract
BrokerChain, a high-performance blockchain sharding protocol proposed by Prof. Huawei Huang's research group in 2022, addresses core challenges in blockchain scalability, cross-shard transaction efficiency, and decentralized application (dApp) ecosystem. In June 2025, his team implemented it as an academic testnet, introducing a dynamic account-partitioning-based state sharding mechanism, broker account-assisted cross-shard transaction method, and a PBFT-integrated intra-shard consensus. This testnet provides a research and development platform for academia and industry, supporting experiments in DeFi protocols, NFT fragmentization for multi-holder trading, and real-world assets (RWA) tokenization. Its core features include EVM compatibility, low gas fee consumption, high-efficiency intra-shard consensus, and user-friendly wallet software, significantly lowering barriers for developers and end-users.

This talk delves into BrokerChain Testnet's architectural design, technological innovations, and real-world running in the past two months. Through dual validation via technological innovation and ecosystem practice, BrokerChain testnet offers a comprehensive paradigm for the blockchain sharding. Its dynamic load-balancing algorithm, hierarchical consensus model, and economic incentive mechanisms provide critical insights for Web3.0 infrastructure development. Looking ahead, BrokerChain is promised to become a benchmark solution for next-generation highly scalable blockchains.

Biography
Huawei Huang is a Professor at Sun Yat-sen University, a recipient of the Guangdong Provincial Outstanding Youth Science Fund, and a dual-appointment professor at the Hong Kong Advanced Research Institute (HKARI) of SYSU. Since 2023, he has been consecutively recognized among the Top 2% Scientists Worldwide by Stanford University. He is an IEEE Senior Member and a Senior Member of the China Computer Federation (CCF). His research interests span high-performance blockchain systems and protocols, blockchain finance, DeFi protocols, and Web3 infrastructure and protocols. He has published numerous research findings in CCF-A journals and conferences such as IEEE/ACM ToN, JSAC, TPDS, TSC, TDSC, TIFS, TMC, TC, and INFOCOM. He has served as chair for many international and domestic academic conferences, workshops, and symposiums. He is the author of two English-language blockchain monographs "From Blockchain to Web3 & Metaverse" and "Blockchain Scalability," as well as a popular science book on blockchain, namely "From Blockchain to Web3: building the next-generation Internet". Under his leadership, his team developed and open-sourced a blockchain experimental tool named BlockEmulator, which provides researchers with mature, high-quality experimental framework and code. BlockEmulator has served researchers ranging from over 80 countries and regions worldwide.

Junqin Huang
Shanghai Jiao Tong University, China

Title: Lend Your Idle Power: A Blockchain-Empowered Decentralized Framework for Secure and Open Large Model Training

Abstract
With the rapid advancement of Artificial Intelligence (AI) technology and the rise of large language models, computing resource demands have surged, significantly raising barriers for public participation in model training. Observing the widespread underutilization of idle computing resources—as estimated, the average computing power utilization rate of intelligent computing centers in China is only 30%—we propose DeAI, a blockchain-powered decentralized AI training platform designed to aggregate such idle resources, thereby reducing barriers to participation in large model training. Given the heterogeneity and unreliability of idle computing power, ensuring efficient and accurate training processes becomes critical. To enhance training efficiency and avoid bottlenecks caused by low-computing-power nodes, we design a dynamic model allocation strategy grounded in hardware capabilities recorded on the blockchain. To ensure the correctness of the training process, we introduce a watermask-based optimistic misbehavior detection method that dynamically detects anomalies during training and identifies malicious nodes. Additionally, we design a transparent incentive mechanism based on "distribution according to work" to boost platform engagement. Experimental results and analysis demonstrate that DeAI not only delivers a secure and low-cost platform for large model training but also improves training efficiency by approximately 10% in heterogeneous environments.

Biography
Junqin Huang is a research assistant professor in the School of Computer Science at Shanghai Jiao Tong University. He received his Ph.D. degree from the Department of Computer Science and Engineering at Shanghai Jiao Tong University in June 2024, and the Bachelor degree from the School of Computer Science and Engineering at the University of Electronic Science and Technology of China in June 2018. His primary research interests include blockchain, Internet of Things, data security, and trusted computing.

He has published over 10 papers in high-quality international journals and conferences such as ACM WWW, IEEE TMC, IEEE TIFS, IEEE Network, and IEEE ICDCS, and among them, 4 papers are ESI highly cited papers. He is currently serving as a member of the Youth Editorial Board for BCRA, which is a JCR Q1 journal with the scope of blockchain research and application. He also has served as a member of the Technical Program Committee for several international conferences, including IEEE Blockchain, IEEE ISPA, IEEE VTC. He was honored with the First Prize of the Shanghai Computer Society Natural Science Award, Geneva International Exhibition of Inventions Gold Medal, the National Scholarship for Postgraduate Students, the First Prize in the National University Blockchain Competition, the First Prize in the National College Student Information Security Contest, etc.

Shangrong Jiang
The University of Hong Kong, China

Title: Financial Inclusion via Blockchain: Evidence from a Natural Experiment

Abstract
The lack of formal and verifiable credit records among borrowers is a significant barrier to financial inclusion in developing countries. In this paper, we assess the effectiveness of blockchain technology in improving credit information authenticity and enhancing financial inclusion. Using a novel dataset from the online prosocial lending platform Kiva, we exploit the implementation of a blockchain-based lending protocol change in Kiva Sierra Leone as an exogenous shock to conduct difference-in-differences analyses. Our results show that borrowers attract more guarantors and larger per-guarantor contributions under the blockchain protocol, thereby increasing their likelihood of being funded on the Kiva platform. Microfinance institutions (MFIs) adopting the blockchain protocol also experience lower portfolio risks and extend larger lending volume to borrowers. In addition, the implementation of the blockchain protocol allows MFIs to achieve both growth in financial revenue and reduction in operational expense, thus enhancing the sustainability of their lending services in developing countries. We further explore the sensitivities of blockchain effects and find that the blockchain protocol has a greater propensity to benefit borrowers from rural areas, those with weaker financial credit records, and those seeking microloans in sectors such as agriculture, textiles, and the food industry. Our findings are robust against robustness checks and alternative explanations.

Biography
Shangrong Jiang is a Postdoctoral Research Fellow at HKU Business School, The University of Hong Kong. His research interest lies at the intersection of FinTech, blockchain, and machine learning, with a particular focus on their applications in finance. He has published over ten articles in the renowned journals such as Nature Communications and National Science Review, five of which have been recognized as ESI Highly Cited Papers. His research has received wide media attention, with coverage by CNN, BBC, The Economist, The New York Times, The Washington Post, and China Central Television. His policy reports have received directives from central government leaders and have been highly valued by relevant national agencies. These studies have provided critical references for policy formulation in key industries, generating significant impacts on China's environmental and economic security.

Paper Presentations

Sunday, 10 August 2025 | 14:00-15:00

Paper Presentation Session 1: Blockchain Data Management
Session Chair: Boyu Cui
Room TU107, PolyU

1. A Blockchain-Enabled Data-Sharing Platform with AI Arbitration System for Cross-Organizational Collaboration in the Energy Industry
   Boyu Cui, Chunming Rong

2. Fine-grained Verifiable Data Query for Multi-SPs in Hybrid-Storage Blockchain
   Yifei Ye, Lanju Kong, Wenquan Li, Jin Qian, Lizhen Cui and Qingzhong Li

3. Blockchain-based Decentralized Identity Management for Cyber-Physical Systems Security
   Jiamin Deng, Shichang Huang, Qi Han, Zhe Peng, Rong Gu, Yu Li, Cheng-Kang Chu, Shang Gao and Bin Xiao

Sunday, 10 August 2025 | 14:00-15:00

Paper Presentation Session 2: Blockchain Consensus
Session Chair: Shan Jiang
Room TU103, PolyU

1. ParallelBFT - Parallel Asynchronous Pipeline Consensus Protocol
   Tianxin Wang

2. Fair and Decentralized Committee Selection: Deterministic Bounds for Scalable Distributed Ledgers
   Grigorii Melnikov, Sebastian Mueller, Nikita Polyanskii and Yury Yanovich

3. Breaking Hyperledger's BFT Shield: Experimental Analysis and Mitigation of Queue Poisoning Attacks in SmartBFT-Go
   Anastasiya Biran, Artem Barger, Vladimir Gorgadze and Yury Yanovich

Sunday, 10 August 2025 | 15:20-16:20

Paper Presentation Session 3: Blockchain and Cryptocurrencies
Session Chair: Mingjin Zhang
Room TU107, PolyU

1. Blockchain-Driven Asymmetric Connectedness and Hedging Effectiveness between Cryptocurrencies and Commodities
   Ying Yuan, Peng Liu and Yong Qu

2. Does monetary liquidity affect Bitcoin price
   Jinsha Zhao and Jia Miao

3. Analysis of Liquidity Provision Strategies on Lending Protocols with Full Hedging via Options: Concept and Results
   Leon Evdaev, Kirill Bogomolov, Yehor Tutskyi, Zakhar Tutskyi and Le Evdaev

Sunday, 10 August 2025 | 15:20-16:20

Presentation Session 4: Blockchain Security and Privacy
Session Chair: Xingye Lu
Room TU103, PolyU

1. Lattice-Based Signature Blockchain Design and Key Storage Optimization
   Yutian Wang, Dezhi Xia, Mingxi Chen, Yifan Dong and Yunlei Zhao

2. Certificateless identity authentication scheme based on blockchain sharding
   Xiao Chen, Muhong Huang, Junjie Peng, Sheng Cao, and Xiaosong Zhang

Conference Venue Information

Conference Website: https://bcra-conf.github.io/2025/

Conference Venue

The Hong Kong Polytechnic University (PolyU) - 11 Yuk Choi Road, Hung Hom, Hong Kong.
Position in google map: https://maps.app.goo.gl/MPod3boTUER3vUxT6

Access to PolyU Campus

A conference registration counter is set up at the PolyU entrance at Core P. Please register at the counter there to get access to the PolyU campus. For directions, refer to the campus map included at the end of this booklet.

Transportation from City to PolyU

By MTR

- Head for Hung Hom Station on East Rail Line or Tuen Ma Line, then take the footbridge at Exit A1 to get to the campus.

By Bus

- Take any tunnel bus passing Cross Harbour Tunnel to the Cross Harbour Tunnel Toll Plaza bus stop. Then take the footbridge to get to the campus; or Take any bus routes stopping at the Hong Kong Polytechnic University bus stop at Cheong Wan Road, which is the main entrance of PolyU.

By Taxi

- By Taxi Take Urban red taxis and drop-off at our main entrance at Cheong Wan Road.

Transportation from Airport to PolyU

By MTR

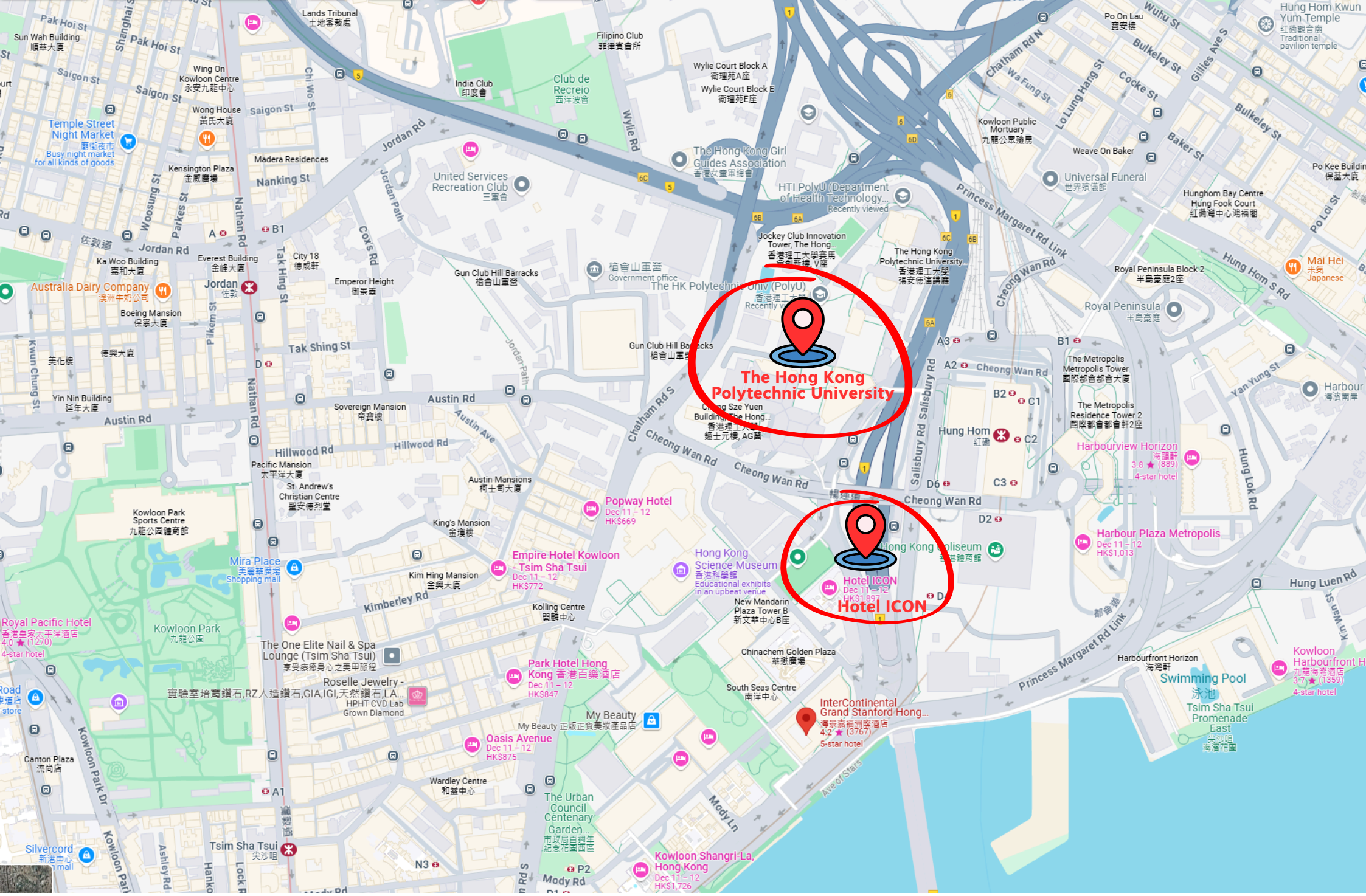
- First take Airport Express from Hong Kong International Airport to Tsing Yi Station. Next interchange to Tung Chung Line for Hong Kong Station at Tsing Yi Station Platform 4. Then interchange to Tuen Ma Line for Wu Kai Sha Station at Nam Cheong Station Platform 2. Get off at Hung Hum Station and take the footbridge at Exit A1 to the campus. A single journey takes around 40 minutes for the ride and costs HK$65 (with Octopus)/HK$81.5 (without Octopus). For more details, please read the MTR website (https://www.mtr.com.hk/en/customer/main/index.html).

By Bus

- Take Cityflyer route A21 from Airport (Ground Transportation Centre) Bus Terminus to Hung Hom Station. Take the footbridge at Hung Hom Station Exit A1 that leads you to the campus. It takes around 75 mins for the ride and costs HK$33. For more details, please read the Citybus & NWFB website (https://www.citybus.com.hk/routes/airport-bus/route/index.aspx?intLangID=).

By Taxi

- Take Urban red taxis to go to PolyU and drop off at the main entrance at Wan Road. It costs around HK$280 and takes around 45 mins for the ride. Additional charges occur for large baggage. The toll and return toll are both payable by a passenger for cross-harbor hiring. For details, please read TAXI FARE (https://www.td.gov.hk/en/transport_in_hong_kong/public_transport/taxi/taxi_fare_of_hong_kong/index.html). You'll want to carry some cash as most of the taxis cannot or will not accept credit card payments for fares.


The Hong Kong Polytechnic University
Hotel ICON

Campus Map 校園地圖

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

KEY TO CAMPUS MAP 校園索引

- A — 圓棟 Core
- M — 座 Block
- 校園控制中心 Campus Control Centre
- 大學醫療保健處 / 診所 University Health Service / Clinic
- 便利店 Convenience Store
- 洗手間 Toilet
- 暢通易達洗手間 Accessible Toilet
- 銀行 / 自動櫃員機 Bank / ATM
- 餐廳 / 酒樓 / 咖啡室 Canteen / Restaurant / Cafe
- 巴士站 Bus Stop
- 運動設施 Sport Facilities
- 停車場 Carpark
- 游泳池 Swimming Pool
- 詢問處 Information
- 自動心臟除顫器 Automated External Defibrillator
- 閣下在此 You Are Here