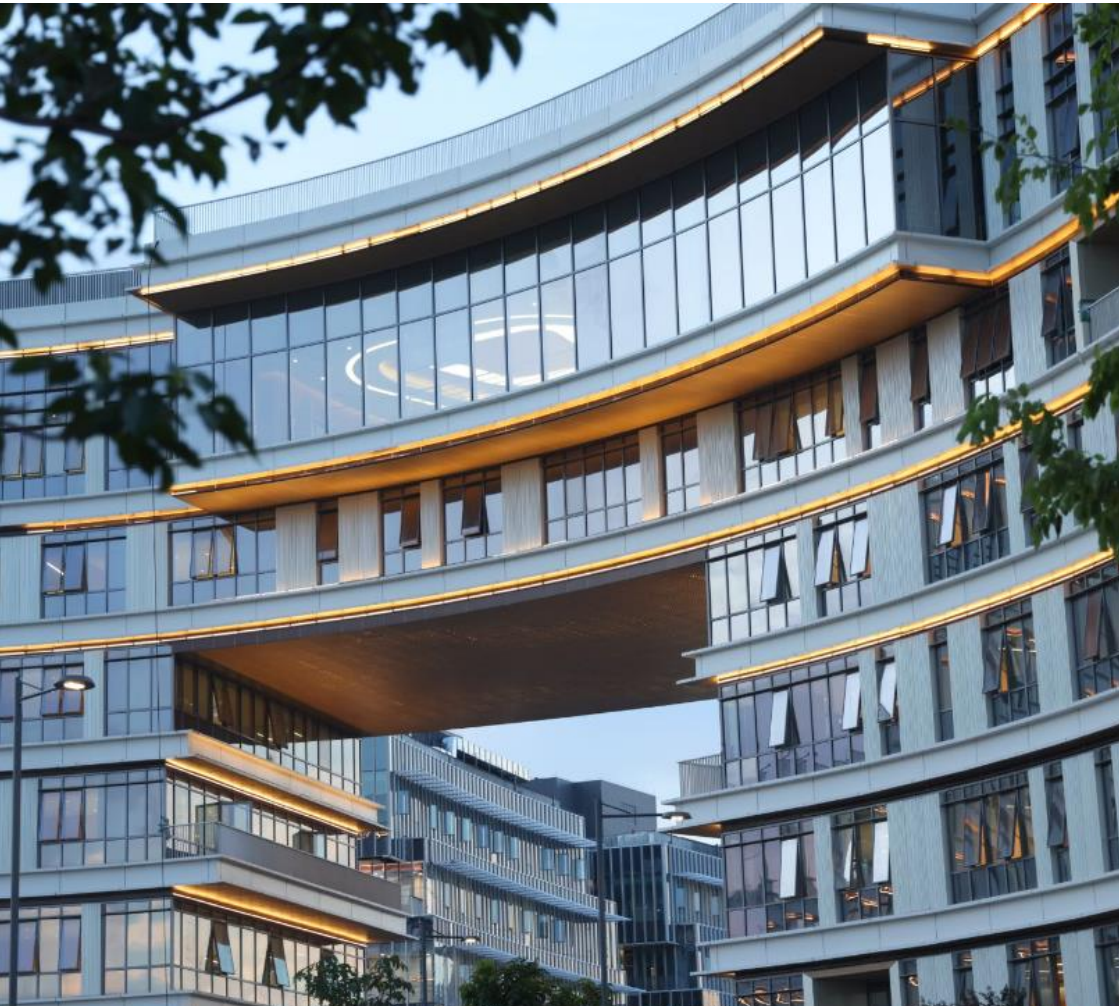
金融科技学域
FinTech Thrust
社会枢纽 SOCIETY HUB

## HKUST(GZ) SOCIETY HUB

# FINANCIAL TECHNOLOGY THRUST

**PH. D. PROGRAM**



# ABOUT FINTECH THRUST

## Overview

**Financial Technology (FinTech)** is an important emerging area that has been developing rapidly in recent years. It refers to the application of cutting-edge technologies and advanced analytics on various financial services and financial challenges, such as digital payments, robo advising, algorithmic trading, blockchain technologies, big data analytics, and central bank digital currencies, aiming to improve service efficiency, promote financial innovations, and increase end-user satisfaction.

## Mission of the FTEC Thrust

Financial Technology Thrust nurtures creative minds to explore frontiers in Financial Technology by employing advanced technologies to improve financial services, promote financial innovations, and establish more efficient financial systems.

## Head’s Message

**Prof. Ning CAI**

**Thrust Head**

Financial Technology Thrust,
HKUST(GZ)

FinTech, short for financial technology, is a burgeoning interdisciplinary field where novel technologies and financial innovations are employed to improve traditional financial services. Its rapid development has changed and will continue to change the global financial system as well as our lives profoundly, and the whole world has been witnessing growing needs for people with FinTech-related expertise. Located in Nansha, the geometric center of the Greater Bay Area, HKUST(GZ) has a unique advantage to develop the FinTech field because both finance and technology are strategically important in the Greater Bay Area. By drawing on the interdisciplinary expertise of our strong faculty, the FinTech Thrust of HKUST(GZ) aims to conduct original and influential research in various areas of FinTech and nurture outstanding researchers, practitioners, and policy makers in the FinTech field, thereby contributing to the economic development of the Greater Bay Area and playing an important role in shaping the future of the FinTech field.

# PHD PROGRAM IN FTEC

**Doctor of Philosophy (PhD) Program** in Financial Technology provides training and education for students to undertake advanced research and have a sound grasp of developments in FinTech. Students graduating from these programs should be able to conduct and apply high-quality research that makes an impact on FinTech research and practice in academia and/or industry. The programs focus on advanced research with an aim to place graduates in academia, research institutes, and industry jobs that appreciate research capability and quality.

## Cross-Disciplinary Focus Areas

- Blockchain technology, smart contracts, and digital currencies
- Robo advising, quantitative investing, and risk management
- Machine learning, artificial intelligence, and big data analytics in finance
- Technological innovations for financial services
- Regulatory issues and challenges in FinTech
- Digital economy and financial inclusion

## Learning Outcomes

**On successful completion of the PhD program, graduates will be able to:**

PhD

- **01** Identify and synthesize current research in FinTech;
- **02** Compare and contrast state-of-the-art knowledge in FinTech and relevant reference disciplines (e.g., accounting, finance, computer science, mathematics), and apply such knowledge in driving FinTech research, practice, and innovation;
- **03** Analyze, design, and execute FinTech research by utilizing proper research methodologies;
- **04** Communicate the developed FinTech knowledge and research with the academic and practitioner community;
- **05** Create original, substantive, and impactful knowledge to advance the state of FinTech research and practice.

# PHD PROGRAM IN FTEC

**Normative PhD duration: 4 years**

- 1st Year coursework
- PhD Qualifying Exam (PQE)
- PhD candidacy
- 2nd to 4th Year Other required coursework
- 4th Year Thesis completion and oral defense
- PhD degree conferred

## GENERAL INFORMATION

Admission to HKUST(GZ)

| | |
|---|---|
| Award Title | Doctor of Philosophy in Financial Technology |
| Program Short Name | PhD(FinTech) |
| Mode of Study | Full-time |
| Normative Program Duration | PhD<br>Full-time:<br>3 years (with a relevant research master's degree),<br>4 years (without a relevant research master's degree) |
| Offering Unit | Financial Technology Thrust Area<br>Society Hub |
| Program Advisor | Program Director:<br>Prof Ning CAI, Professor of Financial Technology |
| Website | https://soch.hkust-gz.edu.cn/academics/ftec/ |
| Enquiry | ftect@hkust-gz.edu.cn |

# PHD PROGRAM IN FINANCIAL TECHNOLOGY THRUST

# CURRICULUM DESIGN

- Core Courses + Required Course + Electives = 21 credits for PhD in minimum
- To meet individual needs, students will be taking courses in different areas, which may include but not limited to courses and areas listed below.

| Course Type | Course Code | Course Title | Credits |
|---|---|---|---|
| Core Courses (6 credits) | IIMP 6030 OR IIMP 6010 | IIMP 6030 Cross-disciplinary Design Thinking I OR Cross-disciplinary Research Methods I | 2 |
| | SOCH 5000 | Technological Innovation and Social Entrepreneurship | 2 |
| | XXXX 5000 | Hub Core Course of other 3 Hubs | 2 |
| **Required Course (3 credits)** | **FTEC 5040** | **Financial Technology Research** | **3** |
| PhD QE courses (18 credits) | FTEC 5030 | Statistical Methods for Financial Technology | 3 |
| | FTEC 5031 | Advanced Probability Theory | 3 |
| | FTEC 5032 | Optimization Theory | 3 |
| | FTEC 5100 | Research in Corporate Finance | 3 |
| | FTEC 5101 | Microeconomic Theory | 3 |
| | FTEC 5110 | Research in Asset Pricing | 3 |
| GTA training (0 credit) | PDEV 6800 | Introduction to Teaching and Learning in Higher Education | 0 |
| Professional Development Course (2 credits) | PDEV 6770 | Professional Development for Research Postgraduate Students | 1 |
| | SOCH 6780 | Professional Development in Innovation, Technology, and Social Responsibility | 1 |
| Thesis Research Course (0 credit) | FTEC 6990 | MPhil Thesis Research | 0 |
| | FTEC 7990 | Doctoral Thesis Research | 0 |

# PHD PROGRAM IN FINANCIAL TECHNOLOGY THRUST

# CURRICULUM DESIGN

| Course Type | Course Code | Course Title | Credits |
|---|---|---|---|
| PhD Electives | FTEC 5050 | Machine Learning and Artificial Intelligence | 3 |
| | FTEC 5060 | Stochastic Processes | 3 |
| | FTEC 5061 | Stochastic Calculus for Financial Technology | 3 |
| | FTEC 5120 | Text Mining in Finance and Economics | 3 |
| | FTEC 5210 | Quantitative Models for Financial Derivatives | 3 |
| | FTEC 5220 | Monte Carlo Simulation in Finance | 3 |
| | FTEC 5230 | Financial Risk Management | 3 |
| | FTEC 5310 | Blockchain Technology | 3 |
| | FTEC 5320 | Decentralized Finance | 3 |
| | FTEC 6000 | FinTech Attachment | 2-4 |
| | FTEC 6101 | FinTech Program Seminar | 0 |
| | FTEC 6910A | Quantitative Investing | 1 |
| | AIAA 5024 | Advanced Deep Learning | 3 |
| | AIAA 5025 | Deep Reinforcement Learning | 3 |
| | DSAA 5009 | Deep Learning in Data Science | 3 |
| | DSAA 5013 | Advanced Machine Learning | 3 |
| | DSAA 5022 | Data Analysis and Privacy Protection in Blockchain | 3 |
| | IOTA 5501 | Convex and Nonconvex Optimization I | 3 |
| | IPEN 5130 | Economics of Technology Innovation and Entrepreneurship | 3 |
| | IPEN 5200 | Uncertainty, Information and Decision Making | 3 |
| | IPEN 5250 | Text Analysis and Machine Learning | 3 |
| | IPEN 5300 | Experimental Economics and Organizational Behavior | 3 |
| | IPEN 5900 | Policy and Technology for Carbon Neutrality | 3 |
| | UGOD 5020 | Quantitative Social Science | 3 |

# HIGHLIGHTS OF FINTECH
# PQE GUIDELINE

## PhD Qualifying Examination (PQE)

The objective is to assess whether students are qualified to proceed to pursue PhD degrees.

**Comprehensive Written Exam**
(Fin part + Tech part)

+

1st year **critical survey paper** & **paper presentation**

**A Pass/Fail grade will be given**

**Written comprehensive examination**

- Students are required to take the written comprehensive examination in two sessions. a) The first session focuses on the Tech part. b) The second session focuses on the Fin part.
- The PG committee will make a Pass/Fail decision based on the graded examination.

**Critical survey paper**

- Students should discuss and ask for advice from their supervisor(s) on the critical survey paper topic. The paper is due by October 7th following the first-year summer. The paper will be presented to the faculty in a 45-minute presentation followed by a 15-minute Q&A session in October following the first-year summer.
- The paper should be at least 20 pages long (including references), double-spaced with 1" margin on all sides, and written in academic English. It should be spell-checked and proof-read. The student should provide a cover page with title and an abstract with no more than 100 words. The paper should cite sources appropriately and be checked for plagiarism.
- After the presentation, the PG committee will evaluate both the written critical survey paper and the oral presentation, which are of equal importance. A Pass/Fail grade will be given.

(1) The Tech part mainly focuses on the materials covered in the following three courses:

- FTEC 5030 Statistical Methods for Financial Technology
- FTEC 5031 Advanced Probability Theory
- FTEC 5032 Optimization Theory

(2) The Fin part mainly focuses on the materials covered in the following three courses:

- FTEC 5100 Research in Corporate Finance
- FTEC 5101 Microeconomic theory
- FTEC 5110 Research in Asset Pricing

**Both Tech part and Fin part will be given a grade of P/MP/F.**

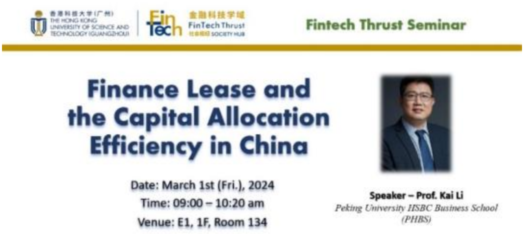
'P'=Pass, 'MP'=Marginal Pass, 'F'=Fail
To pass, the student should obtain one P plus one MP or above in sub-category grades

# RESEARCH SEMINARS

## Thrust Seminars

Thrust Seminars are offered each term every **Friday 9:00 am-10:30 am**

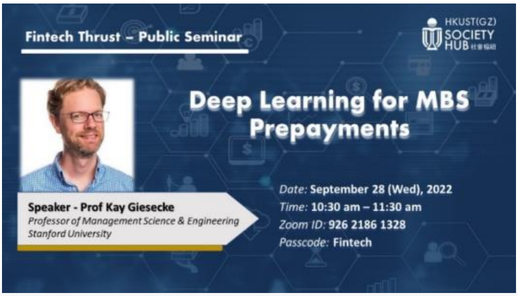
Improving academic communications and enhancing PG students' access to cutting-edge FinTech research





## Public Seminars

Previous public seminars:




# OUR FACULTY

## Regular Faculty at Fintech Thrust

(All names are arranged in alphabetical orders)

### Ning CAI
Head / Professor
**FTEC**
✉ ningcai@hkust-gz.edu.cn
PhD in Operations Research
Columbia University, 2008
Research Interests:
FinTech, Financial Engineering, Risk Management, Green Finance, Stochastic Modeling

### Lionel Ming-Shuan NI
President / Chair Professor
**FTEC | DSA**
✉ ni@hkust-gz.edu.cn
PhD in Electrical Engineering
Purdue University, 1980
Research Interests:
Big Data, High-performance Computing, Internet Technologies, Mobile Computing, Wireless Networking, Intelligent Computing

### Yue Kuen KWOK
Professor
**FTEC**
✉ maykwok@hkust-gz.edu.cn
PhD in Applied Mathematics
Brown University, 1985
Research Interests:
Financial Mathematics, Computational Mathematics, Financial Engineering

### Yingying LI
Chair Professor
**FTEC | ISOM | FINA**
✉ yyli@ust.hk
PhD in Statistics
The University of Chicago, 2008
Research Interests:
Financial Big data, Statistical Learning, Portfolio Analysis, Risk Management

### Ziteng CHENG
Assistant Professor
**FTEC**
✉ zitengcheng@hkust-gz.edu.cn
PhD in Applied Mathematics
Illinois Institute of Technology, 2021
Research Interests:
Risk-Averse Decision Making, Reinforcement Learning, Inverse Reinforcement Learning, Mean Field Games, Mathematical Finance

### Bingyan HAN
Assistant Professor
**FTEC**
✉ bingyanhan@hkust-gz.edu.cn
PhD in Statistics
Chinese University of Hong Kong, 2020
Research Interests:
FinTech, Optimal Transport, Mathematical Finance

## Siguang LI
Assistant Professor
**FTEC**
✉ siguangli@hkust-gz.edu.cn
PhD in Economics
Cornell University, 2022
Research Interests:
Fintech, Digital Economies, Social Media, Industrial Organization, Applied Theory

## Xiaoyu WANG
Assistant Professor
**FTEC**
✉ xiaoyuwang@hkust-gz.edu.cn
PhD in Mathematics
Florida State University, 2021
Research Interests:
Theoretical Machine Learning, Financial Engineering, Stochastic Systems

## Xuechao WANG
Assistant Professor
**FTEC | IOT**
✉ xuechaowang@hkust-gz.edu.cn
PhD in Electrical & Computer Engineering
University of Illinois at Urbana-Champaign, 2023
Research Interests:
Blockchain, Decentralized Finance

## Yingjie XUE
Assistant Professor
**FTEC | IOT**
✉ yingjiexue@hkust-gz.edu.cn
PhD in Computer Science
Brown University, 2023
Research Interests:
Distributed Computing, Blockchain Technologies, Decentralized Finance, Cryptocurrencies, Cybersecurity and Privacy

## Zixuan YUAN
Assistant Professor
**FTEC | AI**
✉ zixuanyuan@hkust-gz.edu.cn
PhD in Information Technology
Rutgers University, 2023
Research Interests:
Data Science and Artificial Intelligence, Financial Technology, Text Analytics, Recommendation Systems

## Chao ZHANG
Assistant Professor
**FTEC**
✉ chaoz@hkust-gz.edu.cn
PhD in Statistics
University of Oxford, 2022
Research Interests:
Machine Learning in Finance

## Guang ZHANG
Assistant Professor
**FTEC | ISOM**
✉ guangzhang@hkust-gz.edu.cn
PhD in Economics
Boston University, 2021
Research Interests:
FinTech, Financial Econometrics, Machine Learning, Empirical Finance

## Leifu ZHANG
Assistant Professor
**FTEC**
✉ leifuzhang@hkust-gz.edu.cn
PhD in Finance
Washington University in St. Louis, 2021
Research Interests:
FinTech, Information Economics in Financial Markets, Adversarial/Strategic ML/AI & Its Applications, Decentralized Finance (DeFi)

## Yi ZHANG
Assistant Professor
**FTEC**
ethanyizhang@hkust-gz.edu.cn
PhD in Finance
Imperial College London, 2023
Research Interests:
Theoretical and Empirical Climate Asset Pricing, Climate Finance, Macro Finance, ESG, Text Mining, China Economy, Applied Machine Learning

## Ying ZHANG
Assistant Professor
**FTEC**
yingzhang@hkust-gz.edu.cn
PhD in Mathematics
University of Edinburgh, 2020
Research Interests:
Numerical Algorithms Design, Machine Learning and Finance, Stochastic Optimization

## Zimu ZHU
Assistant Professor
**FTEC**
zimuzhu@hkust-gz.edu.cn
PhD in Applied Mathematics
University of Southern California, 2021
Research Interests:
Stochastic Control and Games, Mathematical Finance, Principal-Agent Problem, Machine Learning

## Ruiting ZUO
Assistant Professor
**FTEC**
ruitingzuo@hkust-gz.edu.cn
National University of Singapore, 2022
Research Interests:
Finance-Operations Interface, E-Commerce and Marketplace Analytics, Operations-Marketing Interface, Game Theory, Optimal Control, Data-driven Decision Making

## Professor of Practice and Industry Advisors

QI Lei 齐磊 博士 – *Associate Professor of Practice with Fintech*
*Co-Founder and CEO* 创业合伙人兼总经理
Wizard Capital Research Ltd. 蔚泽资本

CHENG Rocky 郑松岩博士
*General Manager of Information Technology Department* 资讯科技部总经理兼首席信息官
Bank of China (HK) 中国银行（香港）

GUO Jian 郭健 博士
*Assistant President and Chief Scientist of AI Finance & Machine Learning* 助理院长兼人工智能金融与机器学习首席科学家
International Digital Economy Academy at GBA(IDEA) 粤港澳大湾区数字经济研究院

JIA Hongrui 贾红睿 博士
*CEO* 行政总裁
SPDB International 浦银国际

MA Henry 马智涛 先生
*Executive Vice President and Chief Information Officer* 副行长兼首席信息官
WeBank微众银行

MA Jian 马坚 博士
*Executive Director of Quantitative Research* 量化研究总监
J.P. Morgan 摩根大通

XIAO Jing 肖京 博士
*Chief Scientist* 首席科学家，执委
Ping An Group 平安集团

XU Xiaohong 徐晓红 博士
*Partner and Chief Executive Officer* 创业合伙人及总经理 兼任国家外汇管理局中央外汇业务中心顾问
Zhuhai Defen Financial Technology Co. 珠海得分金融科技有限公司

# OUR STUDENTS

## Educational/Academic background of current Fintech Students

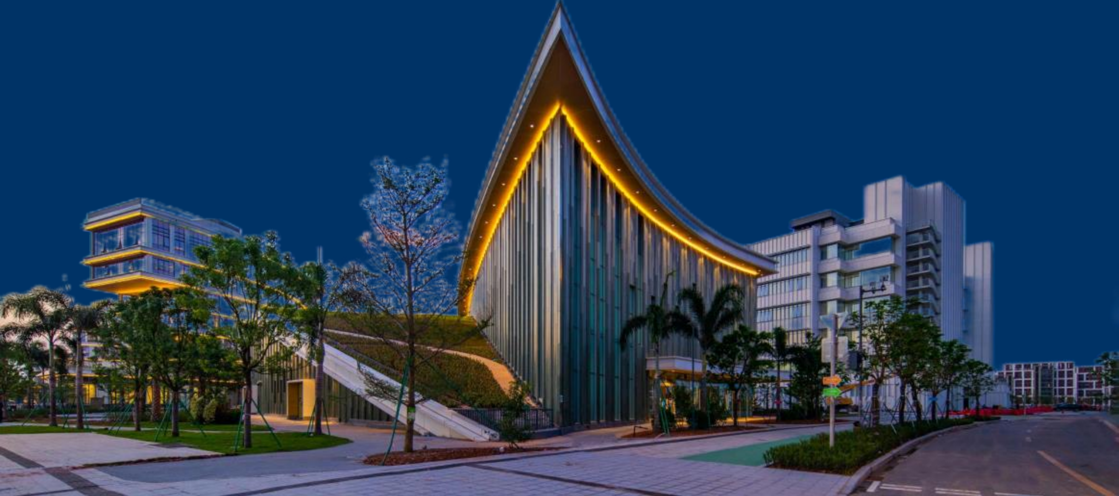
### Academic Backgrounds

- Applied Mathematics
- Big Data Technology
- Economics
- Financial Engineering
- Computer Science
- Statistics
- Finance
- Electrical Engineering
- National Information Management
- Mathematics
- Information Engineering
- Computer Engineering
- Applied Mathematics
- Mathematical Finance
- Finanical Management
- ......

### Graduate Universities/Colleges

***Undergraduate Studies:***

***Postgraduate Studies:***



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