

Hugo Wai Leung MAK

Curriculum Vitae (in brief)

Personal Information

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Languages: English (fluent), Mandarin (fluent), Cantonese (native)

Brief Description

- Particularly strong in applying data analytic and computational approaches, as well as machine learning techniques to solve real-world problems arising from physical and social science disciplines
- Possess enormous experience on interdisciplinary projects with synergized efforts, and show good independence of mind and responsibility to take up challenges
- Acquire genuine enthusiasm and motivation in scientific breakthrough, education administration and knowledge exchange, as well as nurturing the next generation

Research Interests (Refer to Publication List for Journal and Conference Publications)

Applied and Computational Mathematics & Data Science: Remote Sensing and Environmental Informatics; Data Assimilation and Machine Learning Algorithms; Spatial Data Analytics; Satellite Image Processing; Smart and Sustainable City Development

University Employments

- Aug 2021 – present **The Hong Kong University of Science and Technology (HKUST)**
- **Visiting Faculty Member (Part-time Appointment)**, Department of Mathematics
 - **Junior Fellow**, The Academy of Education Excellence (AEE) (Jan 2025 – present)
 - **Instructor and Coordinator of MSc Project**, Master of Science in Mathematics for Educators (MAED) Program
 - **Programme Coordinator of Mathematics**, The Center for the Development of the Gifted and Talented (CDGT) (Aug 2022 – Jul 2024)
- Aug 2021 – present **The Chinese University of Hong Kong (CUHK)**
- **Lecturer**, Department of Mathematics
 - **Instructor**, Program for the Gifted and Talented, Faculty of Education (Sep 2024 – present)
- Apr 2020 – Aug 2021 **The University of Hong Kong (HKU)**
- **Research Assistant Professor**, Department of Geography & Department of Electrical and Electronic Engineering
 - **Management Committee Member**, Joint Laboratory on Future Cities (JLFC)
- Aug 2019 – Apr 2020 **The Chinese University of Hong Kong (CUHK)**
- **Lecturer of Mathematics**, Faculty of Engineering
 - **Facilitator**, STEM Programme, School of Science

Tertiary Education

- Sep 2016 – Jul 2019 **Ph.D. in Mathematics (with Scientific Computation Concentration)**
The Hong Kong University of Science and Technology (HKUST)
- Dissertation:** Improved Remote Sensing Algorithms and Data Assimilation Approaches in solving Environmental Retrieval Problems (*doi: 10.14711/thesis-991012752564803412*)
- Supervisor:** FUNG, Jimmy Chi-Hung; **External Examiner:** KIM, Jhoon (Yonsei University)

Aug 2015 – **Research Postgraduate Programme, Articulated Ph.D. in Information Engineering** (*attended*)
 Jul 2016 **Department of Information Engineering, The Chinese University of Hong Kong (CUHK)**

Jan 2013 – **B.Sc. in Mathematics and B.Sc. in Physics (1st Class Hons), with a minor in Liberal Studies**
 Jun 2015 **The Hong Kong University of Science and Technology (HKUST)**

Other Selected Appointments (in Academia / Industry)

Sep 2024 – **Hong Kong Examinations and Assessment Authority (HKEAA)**
 present **HKDSE Physics Subject Committee Member**

Sep 2022 – **Oxford University Press**
 present **Academic Consultant in Mathematics (Part-time Appointment)**

Aug 2022 – **Hong Kong Science and Technology Parks Corporation (HKSTP)**
 Jul 2025 **Co-opted Member, Admission Panel of the Incubation Programmes (Ideation & Incubation)**

Aug 2020 – **The Chinese University of Hong Kong (CUHK)**
 Aug 2022 **Subject Expert Panel Member (Part-time Appointment), Centre for Learning Enhancement And Research (CLEAR)**

Sep 2018 – **Hong Kong Scholars Education and Philanthropy Foundation Limited (HK Scholars)**
 Jan 2019 **Ph.D. Researcher and Trainer, Science Stream (Part-time Appointment)**

Mar 2018 – **The Hong Kong University of Science and Technology (HKUST)**
 Aug 2019 **Academic Consultant & Mentor (Part-time Appointment), Summer Research Program in Industrial and Applied Mathematics (SPIA), The Hong Kong University of Science and Technology (HKUST) and Seoul National University (SNU)**

Sep 2016 – **The Hong Kong University of Science and Technology (HKUST)**
 Jul 2019 **Ph.D. Candidate and Graduate Teaching Assistant, Department of Mathematics**

Aug 2016 – **The Chinese University of Hong Kong (CUHK)**
 Aug 2018 **Part-time Teaching Assistant (Head of TA Team), Enrichment Programme for Young Mathematics Talents (EPYMT)**

Jul 2015 – **The Chinese University of Hong Kong (CUHK)**
 Jul 2016

- **Researcher and Graduate Teaching Assistant, Department of Information Engineering**
- **Research Assistant, Department of Mathematics**

Sep 2014 – **The Hong Kong University of Science and Technology (HKUST)**
 Feb 2015 **Research Assistant (Part-time Appointment), Department of Mathematics**

Apr 2014 – **The Hong Kong Academy for Gifted Education Ltd. (HKAGE)**
 Mar 2015 **Consultant and Mathematics Instructor**

Jan 2014 – **St. Joseph's College**
 present **Academic Advisor and Substitute Teacher (Part-time Appointment)**

Selected Accomplishments / Personal Experience

(1) Scientific Talks and Education Sharing

Have delivered more than **40 talks / sharing** in public events, international conferences, workshops and forums since 2016, and some recent invited speeches and talks in 2024 and 2025 are listed below:

- HKLF Exploring New Horizons 2025 (Mar 2025)
- St. Joseph's College 150th Anniversary Mathematics Forum (Feb 2025)
- World Mathematics Invitational (WMI): Hong Kong Prize Giving Ceremony, Hong Kong, China (Feb 2025, Mar 2024); Hong Kong Representative Team Coronation Ceremony (Jun 2024)
- 民政事務總署: 全港青年學藝比賽大會五十周年金禧晚宴 (Feb 2025)
- 南京工业大学第九届“探·智”国际青年学者论坛, Nanjing Tech University, China (Dec 2024)
- The 7th and the 8th Asia Conference on Cognitive Engineering and Intelligent Interaction (CEII 2024 & CEII 2025) (Dec 2024; Dec 2025)
- Shaw Prize Chat: Mathematical Insights: Conversation with Prof. Peter Sarnak (Nov 2024)
- Remote Sensing (Journal): Personal Sharing on Data Analytics, Data Science Research and Tips on Academic Reviewing (Oct 2024)
- EuroScience Open Forum 2024, Katowice, Poland: Invited Lecture (Jun 2024)
- AI in Education Forum on “Accelerating Learning with AI: Why and Why Not? The Perspectives of Educators”, CUHK Centre for Bioethics (CBIOE) and Centre for Learning Enhancement And Research (CLEAR), CUHK (May 2024)
- International Symposium on Remote Sensing (ISRS 2024), Taichung, Taiwan (Apr 2024)
- Radio Television Hong Kong (RTHK) – Putonghua Channel (新人類、大世界): on STEM Education and The 3rd STEAM Contest and Exhibition (from AI to SI) and Artificial Intelligence Video Contest (Jan 2024)
- International Symposium on Data Science (DSWS-2023), Science Council of Japan, Tokyo, Japan (Dec 2023)

etc.

(2) Professional Academic / Community Service & Membership

- Act as an **Editorial Board Member / Special Issue Editor** of numerous Mathematics / Data Science / Applied Science journals, for example:
 1. Mathematics – Guest Editor of Special Issue “Optimization, Modeling and Data Analytic Approaches in Network Coding” (Jun 2024 – present)
 2. Algorithms – Guest Editor of Special Issue “Development of Machine Learning and Artificial Intelligence Algorithms in Environmental Retrieval Tasks” (Mar 2024 – present)
 3. Frontiers in Sustainable Resource Management – Topic Editor of “New Insights and Advancement of Land Use Analytics in Modern City Development” (Mar 2023 – present)
 4. Applied Sciences – Guest Editor of Special Issue "Smart City Environmental Monitoring Systems" (Apr 2022 – Dec 2023)
- Act as **Scientific / Programme / Technical Committee Member** and **Organizing Committee Member** of more than 20 conferences and workshops, and act as **Publicity Chair / Workshop Chair / Session Chair** for more than 5 conferences and workshops, starting from 2023
- Act as **Topical Advisory Member / Reviewer Board Member** in more than 10 organizations / journals, for example: Royal Society of Chemistry (RSC); Hang Lung Mathematics Awards (HLMA); S.T. Yau High School Science Award (Asia); Remote Sensing (Journal); Mathematics (Journal); 10th International Congress on Industrial and Applied Mathematics (ICIAM 2023 Tokyo); and act as a **regular Academic Reviewer** of more than 30 academic journals, with more than 10 as Q1 journals in the world

- Possess the following external **research-based membership**:

1. Cabauw Intercomparison of Nitrogen Dioxide Measuring Instruments-3 (CINDI-3) Team, Royal Netherlands Meteorological Institute (KNMI) – Member (Dec 2023 – present); Member of glyoxal inter-comparison team (Jun 2024 – present)
2. Geostationary Environment Monitoring Spectrometer (GEMS) International Science Team (Nov 2019 – present) and Validation Team (Oct 2020 – present), Satellite Mission, South Korea – Member & Researcher
3. Japan Geoscience Union (JpGU) – Regular Member (Feb 2019 – present)
4. London Journals Press (UK) – Quarterly Franklin Membership (Nov 2018 – present)

(3) Projects and Grants

Have taken part in different joint academic and industrial projects, and have been the **Principal Investigator (PI) / Co-Investigator (Co-I)** of various research grants in **Mathematics, Data Science and Mathematics Education**.

1. Mathematical and Computational Methods for Artificial Intelligence (AI) and Financial Technologies (FinTech), **Gifted Education Fund, Education Bureau, Jan 2025 – present, Team Member**. Ongoing.
2. Evaluation of GEMS Level-2 products over East Asia using LIDAR remote sensing, air quality monitoring network and model simulation, **GEMS Validation Team, National Institute of Environmental Research, Climate and Air Quality Research Department, Environmental Satellite Center, Korea, Oct 2020 – present, Co-Investigator**. Ongoing.
3. Developing a Comprehensive Mechanism for Quality Assurance and Enhancement of eLearning Micro-Modules (MM), **Teaching Development and Language Enhancement Grant (TDLEG), CUHK, UGC, Aug 2020 – Aug 2022, Subject Expert Panel**. Completed.
4. Combination of Remote Sensing and Machine Learning Algorithms for Air Pollution Monitoring and Evaluation, **Seed Fund for Basic Research for New Staff, HKU, Jun 2020 – Aug 2021, Principal Investigator**. Completed.
5. Investigation of Human-Environment Relationship, Sustainability and Resilience of Future Cities, *Donations from Prosit Philosophiae Foundation, Joint Lab on Future Cities (JLFC), HKU, Apr 2020 – Aug 2021, Management Committee Member*. Completed.
6. Environmental and Atmospheric Data Science Projects, **Summer Research Program in Industrial and Applied Mathematics (SPIA), Department of Mathematics, The Hong Kong University of Science and Technology and Seoul National University, 2018 & 2019. Principal Investigator**. Completed.
7. Math Support Center for WeBWork Development, **Teaching and Learning Grant, HKUST, May 2015 – Aug 2017, Investigator**. Completed.

(4) Outreach Activities and Services

- Actively participated in all types of **industrial and academic activities**, as well as **Community Engagement and Knowledge Exchange** activities, with the aim of promoting STEM, Applied Sciences and Mathematics to the general public
- Collaborate with **external local and international organizations** in organizing Mathematics and Science competitions, academic exchange programmes and conferences, and connect with NGOs for practical research projects and event organizing; Serve as a member of relevant committees of highlighted events
- Was awarded the title **學藝大使** by 全港青年學藝比賽大會 to promote academic and culture to Hong Kong communities and citizens; obtained the **Permitted Teacher under Education Ordinance (Cap. 279)** from Education Bureau, HKSAR Government

More information about my personal research outputs, awards and details of services will be provided upon request.