香港浸會大學
HONG KONG BAPTIST UNIVERSITY

香港浸會大學理學院
HKBU Faculty of Science

DEPARTMENT OF MATHEMATICS
數學系

CMFAI
Centre for Mathematical Foundations of Artificial Intelligence

Joint Research Institute for Applied Mathematics

SRCC
Statistics Research and Consultancy Centre

DISTINGUISHED LECTURE SERIES 2024/25

Prof. Stephen T. C. Wong

Houston Methodist Hospital and Cornell University, USA
Distinguished Professor of Science, Hong Kong Baptist University, HKSAR

Dr. Stephen T.C. Wong holds the John S. Dunn Presidential Distinguished Chair in Biomedical Engineering and serves as Founding Chair of the Department of Systems Medicine and Bioengineering, Director of the T.T. & W.F. Chao Center for BRAIN, Director of the Translational Biophotonics Laboratory, and Associate Director of the Houston Methodist Neal Cancer Center. He is a tenured Professor at Houston Methodist and Cornell University and holds professorial appointments at Rice University, the University of Texas Health Science Center at Houston, Texas A&M University, Baylor College of Medicine, MD Anderson Cancer Center, the University of Houston, and, most recently, Hong Kong Baptist University. He previously held professorial positions at Harvard University, UCSF, and UC Berkeley.

Dr. Wong's laboratory integrates engineering, computing, biology, and physics to advance diagnosis and treatment, with a focus on cancer and neurological disorders. His career contributions span multiple industries: he helped develop the first VLSI MB DRAM at Bell Labs, the first thermal inkjet printer (ThinkJet) at HP, and the first massively parallel deductive database management system at Japan's Fifth Generation Computer Systems Project (ICOT). He co-developed the world's first hospital-wide PACS at UCSF, revolutionizing radiology practice, and led the creation of the largest radiology information system in Europe at Philips Healthcare and the largest web-based brokerage platform in the U.S. at Charles Schwab. At Harvard Medical School, he founded their first Bioinformatics Research Center for Neurodegenerative Diseases, pioneering the use of systems biology and machine learning for drug discovery, and established Brigham and Women's Hospital's first cyclotron and translational imaging facilities for functional and molecular imaging research.

Dr. Wong is an elected Fellow of IEEE, AIMBE, IAMBE, ACMI, AMIA, Optica, AAIA, and AIIA. He has mentored over 170 PhD students, MD/PhD students, and postdoctoral fellows, with four achieving endowed professorships and six advancing to clinical department chair or section chief positions. He has authored over 500 peer-reviewed publications and five books, secured over $100 million in research funding, and holds 12 patents. He is a native of HK.

Venue:

RRS905, Sir Run Run Shaw Building, Ho Sin Hang Campus, HKBU

17 June 2025, 10:30 - 11:30 (Reception at 10:00)

Innovating Healthcare Delivery and Drug Discovery through Spatial Intelligence: Case Studies in Stroke, Cancer, and Alzheimer's

Spatial Intelligence—the capacity to analyze, interpret, and act upon spatially-resolved data across geographic, structural, imaging, video, and positional modalities—represents an emerging frontier in biomedical research and healthcare transformation. By integrating artificial intelligence, biomedical imaging, and spatial omics, Spatial Intelligence not only enhances the high-dimensional interpretation of complex biological and clinical data but also introduces fundamentally new approaches for spatial reasoning, spatially-aware predictive modeling, and dynamic, location-sensitive decision support. In this talk, we will present the development of innovative spatial intelligence pipelines that leverage AI to extract, integrate, and infer latent spatial information across multimodal and multimedia datasets, including radiology, pathology, microscopy, genomics, and intraoperative imaging. These pipelines bridge molecular, cellular, tissue, and systemic scales by combining machine learning, computational modeling, experimental biology, and spatial analytics, offering a paradigm shift in how spatial context is incorporated into biomedical discovery and clinical practice. We will illustrate these advances through case studies in stroke, oncology, and neurodegenerative diseases, demonstrating novel applications of AI-driven spatial intelligence in resolving tissue heterogeneity, reconstructing cellular interaction networks, mapping disease progression, and guiding targeted interventions. These examples underscore the disruptive potential of Spatial Intelligence to overcome entrenched challenges in precision medicine, accelerate drug discovery, enable spatially-informed diagnostics and prognostics, and revolutionize therapeutic strategies through real-time, context-aware decision-making and image-guided interventions.

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