

Joint CQSE & NCTS Seminar

2024
Sep. 20, Friday

Time: Sep. 20, 14:20 ~ 16:20

Title: Quantum Computing and Machine Learning in Precision Medicine

Speaker: Prof. Ka-Lok Ng (Department of bioinformatics and medical engineering, Asia University)

Place: Rm. 104, Chin-Pao Yang Lecture Hall, Department of Physics/CCMS, NTU

Online Link:

<https://nationaltaiwanuniversity-zbh.my.webex.com/nationaltaiwanuniversity-zbh.my/j.php?MTID=m7601bdfa496ccaf8aac2838aab8c25f2>

Abstract:

Quantum computing, with its ability to harness quantum parallelism, is rapidly emerging as a transformative technology. This talk will begin with a review of the history of quantum computing, highlighting well-known quantum algorithms that showcase its computational advantages. The presentation will then focus on the integration of quantum computing and machine learning (QML). By bridging these fields, QML opens new frontiers in precision medicine, offering powerful tools for analyzing complex biological data and predicting patient outcomes. We will explore applications of QML in detecting and treating cancer diseases at a molecular level. A special emphasis will be placed on the concept of quantum information, particularly in the context of DNA mutations during transcription and translation processes, and how quantum information may be lost or altered. This cross-talk between quantum computing and molecular medicine could redefine the future of personalized healthcare and deepen our understanding of biological processes.

Biography:

Dr. Ka-Lok Ng earned his PhD in physics at Vanderbilt University in the United States. Currently, he is a distinguished professor in the Department of Bioinformatics and Medical Engineering at Asia University, Taiwan.

Dr. Ng has authored over 100 articles in scientific journals and conferences, along with two monographs in bioinformatics. These articles cover topics such as next generation sequencing (NGS) data analysis, multi-omics computational systems biology, network

biology, DNA data hiding, high energy physics, and polarization of cosmic microwave background radiation. His current research focuses on, the use of quantum machine learning tools to identify cancer biomarkers and network isomorphic problems. Since December 2009, Dr. Ng has served on the editorial boards of several scientific journals. He was the Editor-in-Chief of the WSEAS Transactions on Biology and Biomedicine. He also has experience organizing international renown conferences, including the IEEE International Conference on Bioinformatics and BioEngineering (BIBE – 2011, 2016, 2018, 2022) and serve as the keynote speaker at the International Conference on Bioinformatics, ICB (2015 to 2018)

