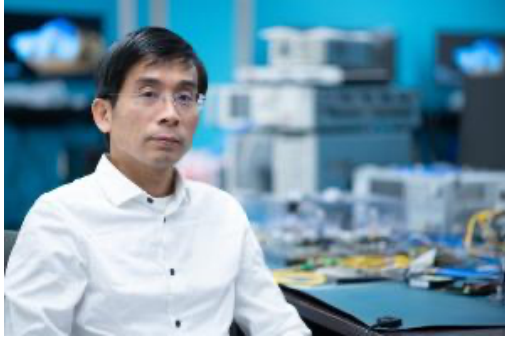


QUANTUM MACHINE LEARNING AND OPTIMIZATION FOR 6G NETWORKS



Dr. Trung Q. Duong (IEEE Fellow, IET Fellow, CAE Fellow, EIC Fellow, and AAIA Fellow) is a Canada Excellence Research Chair and Full Professor at Memorial University of Newfoundland, Canada. He is also an adjunct professor at Queen's University Belfast, UK and a visiting professor under eminent scholar program at Kyung Hee University, South Korea. His current research interests include quantum optimisation and machine learning in wireless communications. He is an author/co-author of 600+ publications with 22,500+ citations and h-index 81. He has served as an Editor for many reputable IEEE journals (IEEE Trans on Wireless Communications, IEEE Trans on Communications, IEEE Trans on Vehicular Technology, IEEE Communications Surveys & Tutorials, IEEE Communications Letters, and IEEE Wireless Communications Letters) and has been awarded best paper awards in many flagship conferences including IEEE ICC 2014, IEEE GLOBECOM 2016, 2019, and 2022. He was the only UK-based researcher awarded both the Research Fellowship and Research Chair from the Royal Academy of Engineering. In 2017, he was awarded the Newton Prize from the UK government. He is currently the Editor-in-Chief of IEEE Communications Surveys and Tutorials and an IEEE ComSoc Distinguished Lecturer. He is a fellow of the Institute of Electrical and Electronics Engineers (IEEE), the Institution of Engineering and Technology (IET), the Canadian Academy of Engineering (CAE), the Engineering Institute of Canada (EIC), and the Asia-Pacific Artificial Intelligence Association (AAIA).



Abstract:



Quantum computing uses the concept of quantum mechanics to offer a massive leap forward in relations to solving complex computation problems. Hybrid quantum-classical machine learning algorithms can significantly enhance the processing efficiency and exponentially computational speed-up, highly capable of guaranteeing high QoS requirements of 6G networks. This talk presents the state-of-the-art in quantum machine learning and optimization and provide a comprehensive overview of its potential, via machine learning approaches. Furthermore, this talk introduces quantum-inspired machine learning/optimization applications for 6G networks in terms of 6G channel estimation and RF fingerprinting considering their enabling technologies and potential challenges. Finally, some dominating research issues and future research directions for the quantum-inspired machine learning/optimization in 6G networks are elaborated.

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