OPTIMIZATION SEMINAR SERIES

Variational Classical-Quantum Hybrid Algorithms for Near Term Quantum Computers

Speaker: Dr Kapil Sharma
Date: September 28, 2020
Time: 10:00 am MST

Where: This is a virtual event

Abstract: The aim of the talk is to introduce the landmark quantum algorithms while focusing on the progress in optimization-techniques which are especially suitable for Near Term Quantum Computers (ie. NISQ devices). In recent years, there is a rapid advancement in developing quantum algorithms for varieties of NP problems encountered in many scientific domains. Hence, it is of our great interest to highlight some of the quantum-algorithms developed to solve the NP problems, despite the fact that the class category P vs. NP has been a debatable topic over the decades. In continuation of this discussion, we also cover the quantum adiabatic computation with D'Wave quantum computer, its drawback and significance. Towards the end of the talk, we touch upon recently developed variational classical-quantum hybrid approach for NISQ devices and discuss the potential use of quantum chemistry in variational framework.

Bio-Sketch: Dr. Kapil K. Sharma completed his Ph.D in Quantum Computation from National Institute of Technology, Allahabad, India and had received two masters degrees in IT and Physics respectively. Prior to Ph.D, he was associated with embedded-system industry for more than 5 years, where he had done extensive programming for various micro-controllers which include 8051,PIC, ARM processor. After completion of his Ph.D, he received three years institute Post-Doctoral fellowship from the electrical engineering department of IIT Bombay, where he made several contributions in many aspects of Quantum Information such as spin squeezing, quantum magnetometer, quantum decoherence dynamics, quantum machine learning etc. After IIT Bombay, he was appointed as a senior research scientist in the Laboratory of Information Technology at Joint Institute for Nuclear Research (JINR), Dubna, Russian federation. JINR is the amalgamation of 18 countries and has the biggest particle accelerator center in Russia. At JINR, Dr. Sharma actively initiated the role of quantum machine learning in High energy physics. Currently, his one of the main research interests includes the development of better quantum algorithms for NP problems on near term quantum computers.

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Optimization Seminar Series talk by Dr Kapil Sharma

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