TEXAS TECH UNIVERSITY
Edward E. Whitacre Jr. College of Engineering™
Computer Science

Machine Learning and Quantum Technology

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11:00 a.m. – 12:00 p.m.
Terry Fuller Petroleum Room 110

Abstract
The combined research of machine learning and quantum technology is a fast-growing field. Machine learning has been recognized as a valuable approach in fundamental and applied physics and has the potential to deliver practical quantum technology. On the other hand, quantum computing has gained interest in the machine learning community with its promise of fast algorithms capable of speeding up the search and optimization process.

With universal fault-tolerant quantum computer still far in the future, my talk will focus mainly on the use of machine learning to implement practical quantum technology. Specifically, I will present the application of machine learning to adaptive quantum-enhanced metrology, another application of quantum technology, to generate robust control policies in the presence of noise whilst the noise model remains unknown. I will then discuss a bottleneck in the implementation of quantum information technology, namely, the quantum state generation, and how techniques in optimization and machine learning can be used to solve difficult problems in this area. Lastly, I will present possible directions in using quantum mechanics to inspire research in machine learning and quantum machine learning with and without an existing quantum computer.

Bio:
Pantita Palittapongarnpim is a postdoctoral fellow in the Department of Physics at University of Warwick, UK, working with Dr. Animesh Datta on generating states and measurements for quantum metrology. She received her PhD from the Department of Physics and Astronomy at the University of Calgary, Canada, under the supervision of Dr. Barry C. Sanders and her MSc under Dr. Alexander Lvovsky, gaining experience in implementation of the machine learning algorithm and experimental quantum optics for quantum information processing. Her research utilizes quantum information, data-driven control, numerical optimization and machine learning to achieve implementation of quantum-enhanced technology.