COURSE CATALOG

Ph.D. in Mathematics and Computer Science

Academic year 2023/2024

FEBRUARY 21-26

TRADITIONAL AND EMERGING METHODS FOR HIGH PERFORMANCE COMPUTING
Introduction to Quantum Computing and applications on Internet Security

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High-performance computing (HPC) is the use of super computers and parallel processing techniques for solving complex computational problems. HPC technology focuses on developing parallel processing algorithms and systems by incorporating both administration and parallel computational techniques. This course covers Traditional and Emerging Methods for HPC.

Quantum computing is an exciting recent frontier of research in which the principles of quantum mechanics are applied to computer science to obtain performances unattainable by a classical computing environment. The benefits of quantum computing can be applied to today's challenging problems such as protein folding, circuit switching, and other classically intractable problems, as well as to improve the performance of machine learning and artificial intelligence. In this course, the basic principles of quantum mechanics and quantum computing are introduced, and the impact of such emerging technology is investigated with a focus on Internet security. In particular, the Shor algorithm, famous for its ability to break current RSA-based Internet security, is introduced, and a fully quantum approach to secure network operations, which is based on the BB84 protocol, is detailed.

CLASS SCHEDULE:

WED 21/02......15:00 - 18:00

THU 22/02......15:00 - 18:00

FRI 23/02.........15:00 - 18:00

MON 26/02.....15:00 - 18:00

CLASSROOM MT 12

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