ECE 592-050 / CSC-591-050 (Fall 2018)
Quantum Computing

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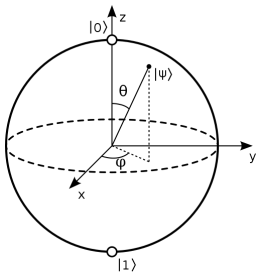
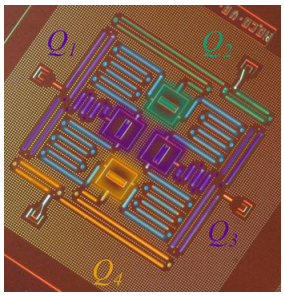
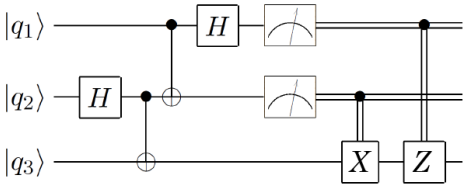
Objective/Description: This course aims to provide an introduction to *quantum computing*. It will feature the three pillars: architectures, programming, and algorithms/applications of quantum computing. Its focus is across all three pillars as well as the assessment of the applicability of problems to quantum computing from a practical point, with only the necessary foundational coverage of the physics and theoretical aspects to understand quantum computing.

Simulation software will be utilized complemented by access to actual quantum computers to prototype problem solutions. This should aid in developing a better understanding of how problems are transformed into quantum algorithms and what programming language support is best suited for a given application area.







Prerequisites: None.

Textbook: Online materials will be provided.

Topics:

- Math and physics foundations
- Adiabatic and gate-model programming
- Software stack: language, compiler, run-time
- Architectures and systems: error correction, control hardware
- Algorithms, complexity, and applications: factoring, search, optimization, …

Grading: Programming assignments, presentation, project, and exams