

QST 206

Quantum Algorithms

Contact information

Professor: TBA

Lecture: TBA

Contact: TBA

Course Description: Building on the material already covered in QST 201 and 205, this course pursues a deeper discussion of algorithms for chemistry, machine learning, and optimization. Specific agenda will concern:

- In depth look at Shor and Grover algorithm
- Quantum-inspired classical algorithms
- Quantum annealing
- Analysis of resource requirements and errors
- The complexity class BQP, which is the set of problems solvable by a quantum computer in polynomial time with bounded error; quantum supremacy.
- Fault tolerant quantum computation & implementation of quantum error correction (Calderbank-Shor-Steane, color code, surface code)
- Quantum compilation optimization
- Quantum supremacy

Grading.

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| • Homework due in Weeks 2–5 (done individually; 7 × 5 percent) | 35% |
| • Homework due in Weeks 7–10 (done in groups; 5 × 6 percent) | 30% |
| • Midterm exam | 20% |
| • Participation on piazza | 10% |
| • Quizzes Total | 5% |