Fall 2021

EEC 289Q - Performance Engineering of Software Systems

Time: MW 10:30 AM – 11:50 AM
Location: TBA
Instructor: John Owens
CRN: 53504
Units: 4

Course Description:
Hands-on, project-based introduction to building scalable and high-performance software systems. Topics include performance analysis, algorithmic techniques for high performance, instruction-level optimizations, caching optimizations, parallel programming, and building scalable systems. The course programming language is C.

The primary means for evaluation in this course is programming assignments, both smaller weekly homeworks and larger (but fewer) projects. Submissions will be graded on both correctness and performance. The instructor has not yet decided whether exams will be part of this course but the majority of the assessment will be through programming assignments.

Required prereq: ECS 36B
Required coreqs: ECS 36C, 122A
Recommended prereq: EEC 170

Planned lectures:
- Intro and Matrix Multiplication
- Bentley Rules
- Bit Hacks
- Architecture and Vectorization
- C to Assembly
- Compilers
- Multicore Programming
- Races and Parallelism
- Analysis of Parallel Algorithms (2 lectures)
- Measurement and Timing
- Cilk Runtime System
- Caching and Cache Efficient Algorithms
- Cache Oblivious Algorithms
- Synchronization
- Speculative Parallelism