

## CAP 6018 Multimedia Programming

**Credits:** 3 credits

**Text book, title, author, and year:** N/A

**Reference materials:** The Software Optimization Cookbook: High Performance Recipes for IA 32 Platforms by Richard Gerber, Aart J. C. Bik, Kevin Smith, Xinmin Tian  
Software Optimization for High Performance Computing: Creating Faster Applications by Isom Crawford, Kevin Wadleigh  
A selection of research papers will be provided

**Catalog description:** This is a graduate level course focusing on software optimization in general and efficient multimedia software and systems development in particular. The course will use a video coding examples to understand complexity, architecture dependencies, and develop high performance applications. The course will introduce efficient programming techniques including software optimization, SIMD programming, Open MP, multithreaded programming, and Intel software development tools (Compiler, Advisor, VTune). The course will include hands-on software development and performance analysis

**Specific goals for the course:** This course is intended to provide a background and experience in the area software development for high performance Multimedia applications.

**Brief list of topics to be covered:**

1. Software optimization
2. Intel software development tools and SDKs
3. Video compression basics
4. Performance analysis
5. Multithreaded Programming
6. Open MP/Multi-core programming
7. SIMD programming (instruction level parallelism)
8. OpenCL (time permitting)