Applied High Performance GPU Computing

- Learn the real-world skills, “black art” techniques, and theory you will need to develop optimal parallelized GPU software.
  - Basic GPU processor & memory architectures, SIMD/SIMT/SPMD
  - GPU kernel design and coding, debugging, profiling, performance analysis, host- and device-side memory and cache optimization

- Basic parallel-GPU algorithms & data structures, parallel design patterns, linear algebra and matrix computations (FFTs, convolutions)

- In-depth case studies of parallel GPU codes:
  - Physically-based rendering/ray-tracing/shading of physics sims
  - Signal, image and video processing
  - Machine learning on GPUs (GPU-MPCNN “ConvNets” Deep Learning)

- Focus on OpenCL 2.x (with Visual Studio and Intel SDK for OpenCL)

- A hands-on, in lab, project-oriented curriculum.
- Class grade based on 4 homeworks, and an in-depth final project.

C/C++ coding intensive!