

# CS554 Project Ideas

## GeMTC:GApp - Porting applications to the GeMTC Framework

### Overview

GeMTC is a CUDA based GPGPU framework which allows Many-Task Computing (MTC) workloads to run efficiently on NVIDIA GPUs. Users call a C API, which allows their task to be scheduled and run on a GPU. Users push a TaskDescription to the GPU, which is a structure containing the application they would like to run, and any parameters for that application. Applications that run inside of GeMTC are referred to as Micro-Kernels.

The successful completion of this project will achieve the following steps:

- Brainstorm/Research/Identify a real application.
- Write a Micro-Kernel for that application.
- Write several tests for the application.
- Compare the results of the CPU vs. GPU versions of the code.

### Relevant Systems and Reading Material

GeMTC – <http://datasys.cs.iit.edu/projects/GeMTC>

Xeon Phi - <http://software.intel.com/en-us/mic-developer>

Swift – <http://swift-lang.org>

### Preferred/Required Skills

**No GPU programming skills required!**

Preferred: OpenMP, Threaded programming. Required: C

### Project Mentor

I am a 3rd year Ph.D. student and 2013 Starr/Fieldhouse Research Fellow from the Department of Computer Science at the Illinois Institute of Technology. I work as a Research Assistant in the Data-Intensive Distributed Systems Laboratory, a Teaching Assistant for the Department of Computer Science, and a Guest Graduate Student Researcher at Argonne National Laboratory.

I am involved in the GeMTC project, which aims to provide improved programmability and efficiency of hardware accelerators (GPGPUs, Intel Xeon Phi) in the Distributed Systems and High-Performance Computing spaces.

More information can be found at <http://datasys.cs.iit.edu/~skrieder> and <http://datasys.cs.iit.edu>

