

# CS554 Project Ideas

## GeMTC:MTCSim - Analyze Many-Task Computing Workflows on GPU Simulators

### Overview

General Purpose Computation on Graphics Processing Units(GPGPU) has enabled many applications to offload compute intensive work to an accelerator such as a GPU. This has the opportunity to free the host CPU and allow for more efficient computations to process on high performance resources. The MTC paradigm involves running many tasks over a short period of time, where the primary metrics are measured in seconds.

The goal of this project is to take existing GPGPU simulators such as [GPGPU-Sim](#) and run [Many-Task Computing](#) Workloads analyzing important metrics from the workloads.

A successful project will complete the following steps:

- Identify advantages/disadvantages of several GPGPU simulators (i.e., GPGPU-Sim)
- Run MTC Workloads across simulators for comparison.
- Adjust GPGPU Simulator Settings to account for current and future generations of hardware.

### 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>

