

## CS Masters' Thesis Defense

**Title:** *Parallel Programming on a GPU Using Intel Array Building Blocks*  
**Speaker:** Chatura Ettigi  
**Date:** Thursday, May 3, 2012  
**Time:** 1:00 p.m.  
**Location:** GMCS 418  
**Thesis advisor:** Dr Joseph Lewis

### **Abstract:**

The goal of this project is to implement Parallel Programming on a GPU using the latest Intel technology called Intel Array Building Blocks (Intel ArBB). The main aim is to describe the programming model of Intel ArBB and show effectiveness of the new technology on a GPU environment using examples. We present an implementation of Parallel Programming on a NVIDIA GTX260M GPU. We describe the evolution of GPU from graphics processor to a platform that can support numerical and parallel computation. The focus is primarily given to the Intel Array Building Block architecture, the API's, programming constructs and their implementations on the GPU with the support of C++ object oriented programming language. We discuss the ways of programming the GPU, the traditional way where we discuss shader programming which requires knowledge of special languages and the GPU framework and the modern way where we use software like Intel ArBB (Rapid Mind) to program a GPU to execute parallelism. We show the parallelism on GPU by sample execution of Vector Product and Matrix Multiplication written in C++, with parallelism provided by Intel ArBB. Finally this thesis lays a base for more advanced GPU programming using Intel ArBB.