CSCE 4643: GPU Programming
Spring 2016

Lecture: M/W/F, 11:50AM - 12:40PM, JBHT 239
Course Management Website: moodle.csce.uark.edu
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Office Hours: Monday 10:30AM - 11:30AM
Wednesday 2:00PM - 3:00PM

Description: This course will introduce massively parallel programming using Graphics Processing Units (GPUs). Basic programming model, GPU thread hierarchy, and GPU memory architecture will be covered. Various performance optimization techniques and parallel patterns will be discussed to deal with real-life applications.

Prerequisites: CSCE 2014 Programming Foundation II or instructor consent


Topics covered: Introduction to data parallelism and CUDA C
Data-parallel execution model
CUDA memories
Performance considerations
Parallel patterns
Advanced CUDA features
Parallel programming with OpenCL and OpenACC

Grading: Grades will be assigned on a 100-point scale as follows.
A: 90-100%
B: 80-89%
C: 70-79%
D: 60-69%
F: <60%

Course tasks are weighed using the following scale.
Quizzes: 10%
Lab assignments: 60%
Final exam: 30%

Lab assignments: You will be assigned for ~10 lab assignments. All labs have to be carried out independently. All solutions will be turned in electronically through moodle. The instructor will compile the solutions and run the executables to verify the results. Please note there is no lecture hour reserved for labs. Students are supposed to carry out the lab exercises in their own time.

▶ The last two lab assignments are required for graduate students and optional (treated as bonus) for undergraduate students.

▶ In order to get a grade in this course, you have to turn in the solutions for ALL required lab assignments.

Quiz: Quizzes are frequently given. Quizzes serve two purposes, i.e., (1) encouraging class participation, and (2) quick test of knowledge learned in the class. Quizzes typically last 5-10 minutes.

Policies: Class Participation – Class participation in class is important to its success. Please ask questions and participate in class discussions. When assigning final grades, borderline cases may be decided based on class participation.

Grading Errors - If the instructor makes errors in grading a lab assignment, you have two weeks following the date the item is returned to see me about correcting the problem. After that time, your grade is set and will not be changed. I also request that you wait 24 hours after a lab is returned before coming to me with questions.

Curving – Final grade may be curved. Whether I curve and how much I curve is at my discretion. I will never curve scores on an individual item.
Email – I encourage you to use email to contact me. Email addresses are listed in the contact information above and are available on the web and class homepage. From time to time, I will send you email, so please check your mail account periodically. The CSCE Department provides an email alias, i.e., csce-4643_gpu@mailman.uark.edu, which includes the entire class. We will use this alias frequently, therefore you must make certain you are checking your uark mail account for new mail. Please note:

► Do not abuse this email alias. Any email sent to csce-4643_gpu@mailman.uark.edu will be broadcasted to the whole class. If you just want to send to individuals, please use individuals’ email accounts.

► You have to use your official uark email account, i.e., either id@email.uark.edu or id@uark.edu, to send emails through csce-4643_gpu@mailman.uark.edu. Your attempt to used other email accounts through this email alias will be bounced back.

Office Hours – I will make every effort to be in my office during scheduled office hours. If there are exceptions, I will let you know as early as possible. You are welcome and encouraged to seek help from me. If you have a conflict with your instructor’s office hours, please make an appointment or stop by my office at another time.

Cheating – Academic misconduct of any kind will result in a 0 score on the lab and the final exam. If the offense is serious, your actions will be reported to the department head and you will receive a failing grade in the course. This may also include a formal entry in your academic record. Your labs must be individually prepared.

Excuses – Excusing a presentation or a class is left to the discretion of the instructor. Illness, family emergencies, and religious observances are examples of acceptable excuses. Computer down time, over sleeping, and social events are examples of unacceptable excuses. Please try to let me know problems in advance when possible and be prepared to provide verification of your excuse.
Extensions – As a policy, I do not extend due dates of labs in general. If I choose to do so, I will only announce the extension in class or through email alias. If you hear that an extension has been granted and I have not announced it in class or through email alias, your information is incorrect.

The followings are the university policies.

Academic Honesty Statement: As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the University’s ‘Academic Integrity Policy’ at honesty.uark.edu. Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

ADA Statement: If any member of the class has a documented disability and needs special accommodations, the instructor will work with the student to provide reasonable accommodation to ensure the student a fair opportunity to perform in this class. Please advise the instructor of the disability and the desired accommodations within the first week of the semester.

Inclement Weather: If the university is officially closed, class will not be held. When the university is open, you are expected to make a reasonable effort to attend class, but not if you do not feel that you can get to campus safely. Assignment due dates will be postponed in case of inclement weather.

Emergency Procedures: Many types of emergencies can occur on campus; instructions for specific emergencies such as severe weather, active shooter, or fire can be found at emergency.uark.edu.

Severe Weather (Tornado Warning):

- Follow the directions of the instructor or emergency personnel.
- Seek shelter in the basement or interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside.
- If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building.
- Stay in the center of the room, away from exterior walls, windows, and doors.

Violence / Active Shooter:

- CALL - 9-1-1
- AVOID - If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
• DENY - Barricade the door with desk, chairs, bookcases or any items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.

• DEFEND - Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.