CMSC 691
High Performance Distributed Systems

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Instructor:

Alberto Cano
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Education:

Ph.D. in Computer Science, University of Granada, 2014
M.Sc. in Intelligent Systems, University of Córdoba, 2013
M.Sc. in Soft Computing and Int. Syst., University of Granada, 2011
B.Sc. in Computer Science, University of Córdoba, 2010

Research: data mining, evolutionary computation, HPC & GPU computing

Lectures:

Tue & Thu 9:30 am - 10:45 am, Engineering Building West 105

Office hours:

Mon & Wed 1:00 pm - 2:00 pm, Engineering Building East E4251
Walk-ins welcome anytime!
24/7 email acano@vcu.edu

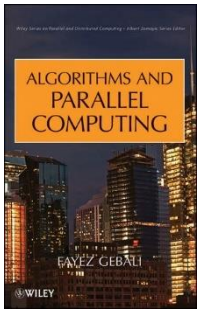
Blackboard:

Announcements, grades, assignments, lecture slides
Please use discussion board for Q&A

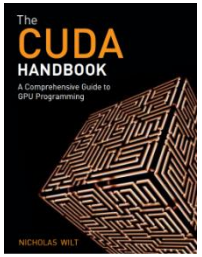
Students:

Please introduce yourself, research interests, expectations of the course, contents, and activities. Email to acano@vcu.edu

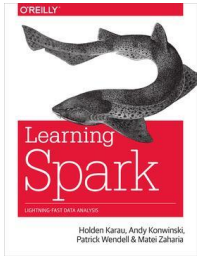
Recommended books:



Algorithms and Parallel Computing
Fayez Gebali
Wiley ISBN 9780470902103



CUDA Handbook: A Comprehensive Guide to GPU Programming
Nicholas Wilt
Pearson Education ISBN 9780321809469



Learning Spark
Matei Zaharia, Patrick Wendell, Andy Konwinski, Holden Karau
O'Reilly ISBN 9781449359034

Major topics:

- Revision of computer organization and performance principles
- Threading and concurrency in C and Java
- Java RMI, OpenMP, MPI
- CUDA single-GPU, multi-GPU, distributed-GPU computing
- MapReduce
- Hadoop and Spark for distributed computing

The main aim of this course is to help you and your research to conduct efficient and scalable high-performance computing using parallel and distributed programming

Project:

- Propose the instructor a topic related to your research interests
- Apply parallel & distributed CPU/GPU computing to speed up your algorithms or to scale them to bigger problems / datasets
- Deliverables: code and documentation (IEEE 2-column latex)
- Defense: 10/15 minute presentation in class
- Peer evaluation included!

This is an intensive programming course:

- Setup a linux system with developer tools (or virtualize)
- build-essential, java, eclipse, cuda

Grades:

Assignments	(25 %)	
Project	(25 %)	
Midterm	(20 %)	(test + coding exercise)
Final exam	(30 %)	(test + coding exercise)

Attendance is not required but it is strongly encouraged.
A cheating offence will result in a grade of F in the course.

Grading scheme:

A	>= 85%
B	>= 75% and < 85%
C	>= 65% and < 75%
D	>= 50% and < 65 %
F	< 50%

Read Syllabus information:

- VCU Email Policy
- VCU Honor System: Upholding Academic Integrity
- Student Conduct in the Classroom
- Students with Disabilities
- Statement on Military Short-Term Training or Deployment
- Excused Absences for Students Representing the University
- Campus Emergency Information
- Important Dates
- VCU Mobile
- Class Registration Required for Attendance
- **Withdrawal from Classes (contact the instructor first!!)**

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