Algorithms for Next-Generation Architectures
Fall 2018

Course Number: CMSE 890-005 (2 credits)
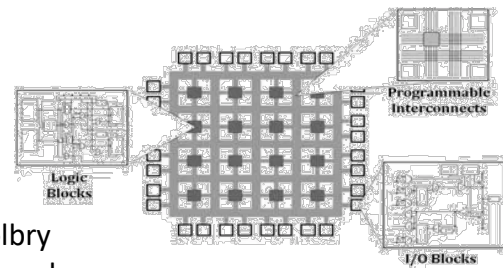**Title:** Algorithms for Next-Generation Architectures
Time: Fridays - 12:40-2:30 p.m. in Fall 2018
Location: 1220 Engineering Building

Instructors: Brian O'Shea, Andrew Christlieb, and Dirk Colbry
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Description: This is an advanced course where students will work side by side with instructors to explore the use of next-generation computer architectures for large scale scientific and engineering applications.

Hardware architectures are constantly changing, and the need to keep up with new paradigms in programming are essential for modern science and engineering. For example, in 2018 two new technologies seem to be competing to corner the market on the road to Exascale supercomputers. These technologies include the newest generation of General Purpose Graphics Processing Units (GPGPUs) and Field Programmable Gate Arrays (FPGA).

This course will look into the pros and cons of these new technologies, and students in the course will investigate their capabilities in order to try to understand how best leverage these new architectures in their own research.

Format: This is a project-based course with topics primarilyy driven by the research interests and needs of the students. Students will work with the instructors to come up with specific learning goals and objectives. All students will be expected to present their work to their peers with a final goal of distilling what they have learned in the form of example codes and training materials that can be shared with future students.

Prerequisites: Students in this class are expected to be comfortable with programming in C, C++, or another compiled programming language and have experience at the Unix/Linux command line. Having experience with parallel programming (at, e.g., the level of CMSE 822) and/or a specific research problem or algorithm that you would like to explore is helpful, but is not required. We also encourage motivated undergraduate students to enroll!

Questions? Contact the instructor for more information, or to obtain an enrollment override.