NEW Fall 2019 Course

**CPEG 467/667: Computational & Data-Intensive Research Platforms & Applications**

TuTh 3:30-4:45PM, Gore Hall 222

*Prof. Rudolf Eigenmann, Department of Electrical and Computer Engineering*

An introductory course for students conducting computational and data-intensive research in all disciplines, providing an overview of relevant computer systems hardware, software, and applications.

**Content:**
- Basics of hardware and system software (CPU and multicore, memory hierarchy, external storage, co-processors, wide-area networking, architectural models including cloud, operating systems, job schedulers, compilers and interpreters, performance evaluation environments)
- Application development and data management (programming languages, organizing programs and data, code management, parallel programming models, program optimization, performance and scaling, checkpointing, algorithms, metadata, data formats, curation and archiving)
- Local and national resources (compute and storage resources, applying for resource use, getting help)
- Use of computational and data-intensive research methods in domain sciences

**Prerequisites:** This course is available to members of computational and data-intensive (CDI) research teams of all sciences. There are no formal prerequisites. Attendees should be involved in CDI research, have substantial experience in developing application code, and be proficient in a programming language. If you are strongly interested in taking this course but do not have such background, contact the instructor.

**Course format:** The course will provide high-level overview of the topics. The emphasis in class and projects will be on applying the course material to the codes and data used in the students’ research efforts. Where available, students will be asked to familiarize themselves with the material through online course content in advance. Many topics will be presented by experts across the domains.

**Course text:** The course will use background material from diverse sources, including video and other online lectures, textbooks, and papers.