DEPARTMENT OF COMPUTER & INFORMATION SCIENCES

2019 CIS SEMINAR SERIES

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GORE HALL 103
11:00^AM

ABSTRACT:

RESEARCH SOFTWARE ENGINEERING AT PRINCETON UNIVERSITY

The Research Software Engineering (RSE) group, housed within the central Research Computing Department at Princeton University, strives to create efficient, scalable, and sustainable research code in order to enable and accelerate new scientific advances. We do this by working as an integral part of traditional academic research groups, providing leadership in the design and construction of complex and highly customized software systems. In this talk, I will begin with an overview of some of the problems facing researchers developing software and how Research Software Engineers can help. I'll describe how the Princeton RSE group originated and is differentiated from other, more traditional, Research Computing efforts. I'll give examples of the wide breadth of recent RSE projects, ranging from highly-scalable astrophysics HPC applications, to statistical modeling software for social science research, to neuroscience imaging experiments. I will share some simple, time-tested, practices and approaches for writing better scientific software that can have long term impacts on sustainability and developer productivity. Finally, I will also touch on training - a key aspect of the RSE group's activities - which takes the form of mini-courses offered year round and the recent introduction of a 4-day computing bootcamp.

BIOGRAPHY:

Ian has a Bachelors in Mechanical Engineering from UDEL, a M.S. in Mechanical Engineering from Syracuse University, and a Ph.D. in Mechanical Engineering from the University of Pennsylvania where he developed the first highly-parallel hybrid atomistic-continuum model for liquid-vapor phase change.

Ian Cosden is the Manager of HPC Software Engineering and Performance Tuning in the Research Computing department at Princeton University. He leads a team of Research Software Engineers (RSEs) who collectively complement traditional academic research groups by offering embedded, long-term software development expertise. He is the co-PI for the Framework for Integrated Research Software Training in High-Energy Physics (FIRST-HEP), an NSF supported project to develop a community framework for software training to prepare the scientific and engineering workforce needed for the computing challenges of HEP experiments. Ian teaches numerous mini-courses and workshops at Princeton on HPC and software engineering topics including parallel programming, performance tuning, and computer architecture. Prior to his current position, he has held roles as a Performance Tuning Analyst and Research Computing Software & Programming Analyst where he worked with researchers to help build, develop, debug, and optimize serial/parallel scientific codes.

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