Introduction to the CI-TEAM Issue

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Forward

The Cyberinfrastructure Training, Education, Advancement, and Mentoring for Our 21st Century Workforce (CI-TEAM) program at the National Science Foundation supported projects that integrated science and engineering research with educational activities that integrated the use of information, communication, and computational technologies. The projects funded under this program encompassed a wide range of applications and activities from both formal and informal education programs. The articles in this issue of the Journal of Computational Science Education (JOCSE) provide descriptions of a cross-section of projects that should be of interest to the broader computational science community. A comprehensive list of recent awards can be found on the NSF website.

Given the wide variety of topics, it is impossible to put all of the projects into very distinct groups. However, there are several components of the projects that are common across large sub-groups. Many of the projects apply Internet and computer technologies toward some educational goal. This includes adaptation of web-based tools to support new communities or provide on-line access to educational materials. Some projects have created portals not only to information but also to simulations and models on a variety of topics with educational objectives. They have used the simulations to reach specific audiences and to stimulate interest in a broad range of science and engineering topics.

Other projects have chosen to study how particular groups of researchers currently use computational tools in their work. Some use this information to create collaboratories that allow researchers to more effectively share that information and potentially improve their research productivity. Still others assist researchers in finding the appropriate cyberinfrastructure tools that will most benefit their research endeavors.

Each of the projects also focused on a different target audience. Many focus on improving the outcomes of education in the STEM (science, technology, engineering, and mathematics) fields by engaging students in the learning process using computer modeling tools and games. A number focus on retraining a specific portion of the workforce, providing them with the skills they need to compete in the 21st century workforce.

The idea for this edition of JOCSE emerged from a meeting of the CI-TEAM principle investigators and their research teams sponsored by NSF and hosted at the University of Illinois in May 2011. At that time, the PIs presented the preliminary results of their projects and shared information on the nature of the topics, methods, and audiences associated with their projects. Many of the projects integrated computer modeling and related cyberinfrastructure tools in their implementation. This led the editors to offer to assemble this special issue of the journal. A call

for papers was released late in 2011. A number of papers were received, peer reviewed, and revised to constitute this issue of JOCSE.

The papers presented herein represent a significant cross-section of the CI-TEAM projects, spanning several topic areas and objectives congruent with those of JOCSE and the computational science education community. We expect you will find the articles provide excellent examples of innovative approaches to cyberinfrastructure-based education programs.