NSF-funded Workshop on Cyberinfrastructure and Engineering Education

The planning committee for the NSF-funded Workshop on Cyberinfrastructure and Engineering Education invites you to apply to participate in the Workshop on **4-5 September 2008** in Washington, DC. The purpose of the workshop is to explore how cyberinfrastructure can enable compelling possibilities for advances in research and innovation in engineering education and consider potential barriers that could prevent these possibilities from becoming reality. The planning committee envisions a highly interactive, two-day workshop that will bring together approximately 40 diverse researchers in engineering education and areas related to cyberinfrastructure. Participants will have the opportunity to network with colleagues with similar research interests and potentially discover new partners for future collaborations. It is our hope that these interactions will lead to new proposal submissions to NSF programs that support applications of cyberinfrastructure to engineering education. If you are interested please complete a web-based application form available at the following URL: https://survey.cehd.umn.edu/Surveys/TakeSurvey.aspx?s=A90B4789CF004ED9A0961C4E8D913099

Applications should be submitted by **31 May 2008**. For applications accepted by the planning committee, workshop travel, lodging, meals, and registration will be covered by a grant from NSF: http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0751249

You are encouraged to pass this information onto colleagues that you know might be interested in this workshop. More information can be found below. We look forward to an exciting, productive workshop.

**Workshop Planning Committee**
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- Jeff Froyd, Texas A&M University (froyd@tamu.edu)
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**Workshop Information**
The National Science Foundation (NSF) in Program Solicitation NSF-07-603 states "[c]omputational thinking is defined comprehensively to encompass computational concepts, methods, models, algorithms, and tools.

Applied in challenging science and engineering research and education contexts, computational thinking promises a profound impact on the Nation's ability to generate and apply new knowledge" (http://www.nsf.gov/pubs/2007/nsf07603/nsf07603.htm). Services created from information, communication, and computational technologies may transform the practice of research and innovation in engineering education. Examples of services that might be created include: (a) large quantitative data sets that could be longitudinal, multi-institution, and/or composed of data from numerous instruments; (b) large qualitative data sets that could be analyzed by cross-institutional research teams to promote increased participation and greater reliability, (c) new research knowledge bases which could provide more effective access to the research and innovations on engineering education, (d) new models for offering degree programs in engineering (e.g., hybirs of face-to-face and online approaches), including new models for graduate programs in engineering education, and (e) new models for cross-institutional collaborative research. Finally, innovative applications of cyberinfrastructure could accelerate the rate at which new and established practices in engineering education innovation and research are shared. Sharing these practices could increase diversity among student and faculty populations in engineering, as well as improve student retention and learning.
However, barriers to applying cyberinfrastructure to advance research and innovation in engineering education are many. These include ensuring security of collected data; addressing privacy concerns when data about an individual is collected from multiple sources and perspectives; navigating IRB approval at multiple institutions; training researchers to use large, complex databases; and resolving ownership of components of the data in large data sets. To explore how cyberinfrastructure can enable compelling possibilities for advances in research and innovation in engineering education and consider potential barriers that could prevent these possibilities from becoming reality, the Workshop planning committee proposes a highly interactive, two-day workshop that would bring together approximately 40 diverse researchers in engineering education from across the nation. The goal of the workshop is to build a set of potential applications of cyberinfrastructure for engineering education research and innovation, identify barriers that would hinder engineering education applications of cyberinfrastructure, prepare approaches to reduce negative influences of these barriers, and increase the likelihood of productive collaboration among participants.

Several national reports have highlighted the potential of cyberinfrastructure to improve research and innovation in engineering education. However, the potential has been realized in few submitted proposals and implemented projects. Identifying and bringing together researchers and experts that contribute different experiences and perspectives will likely create a synthesis that will codify the possibilities and formulate approaches to addressing the barriers. Such a synthesis will begin to stimulate the engineering education community to embrace the potential benefits that cyberinfrastructure offers.

Through applications of cyberinfrastructure, advances in engineering education research and innovation could lead to more engineering graduates who are better equipped to resolve the growing number of complex socio-technical challenges and improve the ability of the United States to maintain its leadership roles in scientific, economic, and technological areas. Other initiatives that create learning experiences that address cognitive, identity, and career preparation development could lead to more diverse enrollment in engineering, and subsequently a more diverse engineering workforce. Through the workshop participants will gain new and broader perspectives on implications and possibilities for using the nation's cyberinfrastructure for innovative approaches to studying engineering education and applying existing and new research.

Participants will discover new partners for future collaborations, which may submit proposals to NSF programs that support applications of cyberinfrastructure to engineering.

Workshop Objectives, Assessment and Evaluation Achievement of the workshop objectives will be assessed by members of the planning committee. Specific workshop outcomes and assessment methodologies are described below.

The specific meeting objectives that will be assessed are the following:

1. Hold a workshop on cyberinfrastructure and engineering education
2. Ensure diversity of participants by gender, ethnicity, career stage, research specialty and institution type
3. Describe possibilities for cyberinfrastructure in engineering education
4. Describe barriers for cyberinfrastructure in engineering education
5. Generate proposals for specific projects combining cyberinfrastructure and engineering education
6. Disseminate meeting results (3 and 4 above) via a journal publication

Qualitative observation at the meeting, including notes by each member of the planning committee, will be used to describe possibilities and barriers (outcomes 3 and 4). Demographic/evaluation surveys of meeting participants will be used to gather data that will be used to evaluate achievement of outcomes 1 and 2. A survey will be sent to meeting participants one year after the meeting to assess outcome 5.
By accepting an invitation and travel funding, you imply consent to participate in the assessment/research component of this meeting. It's your responsibility to notify a member of the Workshop planning committee if you do not wish to participate in the research/assessment. This procedure has been approved by Institutional Review Board (IRB) at Texas A&M University.