Meeting Minutes for Engineering Student Technology Committee

Meeting of September 30, 2003
Internet Cafe Conference Room - 8:00 am

Present: David Bryant (ME), Bryce Eldridge (ECE , Miranda Grote (intra),
Klaus Hartinger (ECE), Tim Hinerman (ME) Doug Hopper (ME),
Shawn Klawitter (ChemE), Prof. Kevin Lear (ECE), Kate McDonnell (ECE),
Dave Miller (ChemE), Mark Ritschard (ENS , Prof. Hiroshi Sakurai (ME),
Assoc. Dean Tom Siller (Acad. Affairs),

Absent: Michael Flick (CE), Arun Nair (CE), Prof. Ranil Wickramasinghe (ChemE)

- Welcome and Introductions

- Corrections to previous meeting's minutes (9/25/03)
NONE

- Status of current strategic initiatives
a) Compute Power
Ritschard requested input on whether Solaris or Linux systems should be purchased. The committee had no preference, so ENS will make the most cost-beneficial purchase to secure more student compute power
b) EECL Computer Lab
The $20K from this committee was supplemented with $15K from Mechanical Engineering ($7K of department funds, $8K of

ME student tech. funds). The new computer lab is well under way, but is not yet complete.

c) Environmental Engineering Lab - no funds spent to date

d) Graduate Citrix Farm

Ritschard provided a brief description of the farm and indicated that it is being used by about 20 graduate students with Sunray thin clients. Feedback so far is positive.

e) Internet Cafe Digital Sender - waiting on table construction

f) Lab Funding Signs - completed

- Discussion on a new university-shared electronic classroom

Siller noted that the Classroom Review Board (CRB) manages all university classrooms, but is willing to share funding of an electronic classroom with Engineering. The CRB no longer receives funds from the university, but will be requesting some from the UTFAB. If UTF funds are made available, the CRB would use those funds to supplement a contribution from our college. If we engage in such a partnership, our college has first rights to the room, even if we fill it with classes all day every day. However, any time not used by Engineering is open to the entire university. Siller solicited interest from the committee in engaging in such a partnership with the CRB.

Ritschard indicated that thin client technology would make it possible to share a classroom with the rest of the university. Although PC's could also be used, the expense of purchase and management would make the venture cost-prohibitive. When asked, he indicated that the cost per seat to refresh the technology every four years would be about $300. In such a proposal, the long-term support costs would be the responsibility of the college (through ENS and the ESTC).

All instructors present felt that no new additional electronic classrooms are needed. The students also felt that there are currently enough computers to satisfy demand at this time. As a result, the committee decided not to pursue a partnership with the CRB at this time.

- Request to use college labs for conferences

Ritschard has received a couple of requests to use Engineering college computer labs for conferences. Executive Associate Dean Dr. Abt has agreed to allow conference use of our facilities outside of the regular semester schedule. However, because conferences would like to use student-funded facilities, this committee needs to consent to that use. Ritschard reported that the labs would be rented to conferences and that the gain to this committee would be approximately $10-$15 per hour of use (not per student). Hinerman moved and Klaus seconded that the current request for conference use in January be approved and used as a test case. Lear amended the motion by adding that the charge for use should be double the actual cost to the ESTC (making a 50% profit) and the amendment was accepted by Hinerman. As amended, the motion passed unanimously. It was then clarified that all charges for the conferences will be received by ENS. ENS will then reimbursement ESTC for twice the actual costs incurred for the use of student resources.

- Changing the lock on the Electronic Classroom

The graduate students in room C211A, the room whose sole entry is through the Electronic Classroom (C211), have asked the ENS Lab Manager Brent Massey to change the lock on room C211 to a permanently locking door. The request was a result of Massey continuing to remind them to lock the door and the difficulty it has become to do so with so many graduate students in the room. The cost would be approximately $250. If the change is made, the graduate students will have access to the room via the card reader. After much discussion, the committee requested that Ritschard speak with Dr. Abt about having either the college or the faculty overseeing the students cover the charge.

- Proposals from Mechanical Engineering

Ritschard is in receipt of two proposals (attached) from Mechanical Engineering, the first of which has two parts. Both proposals are for equipment at the Agricultural Engineering Research Center (AERC). The AERC is in transition to a new purpose and has been referred to by some as the new Performance Engineering Research Center. Once the USDA personnel leave in January, the facility will become a jointly used education and research center used by Chemical Engineering, Civil Engineering and Mechanical Engineering.

Part I of the first request is to establish a computer lab at the facility with used equipment from the ESTC, equipment that normally would have been sold and generated income for the equipment replacement cycle. Part II requests that the ESTC take on ownership of the new computer lab and incorporate it into the regular replacement program. Bryant moved and Miller seconded that the committee donate the $5,814 worth of used equipment for the new lab. The motion passed unanimously. Discussion on Part II will continue next week.

- Tabled agenda items

Proposal from Chemical Engineering
Proposal from Biomedical Engineering
Print credits review
Security camera feedback from ENS (item from last year)
Scholarships (how they are awarded)

- Next meeting

The next meeting will be on Tuesday, October 7, at 8am. Ritschard will try to reserve the Engineering Conference Room.

Submitted by
Mark Ritschard

ESTC Supported Design Labs/Computing Expansion at the AERC

Professor Donald W. Radford, Mechanical Engineering
don@engr.colostate.edu
September 2003

With more undergraduate students than ever in the College of Engineering, the need for more computer design capabilities has put a strain on campus resources, and design space, within Engineering. Recently, the College and Performance Engineering have been involved in redevelopment of the AERC, with an emphasis on advanced engineering technologies. The AERC presently has 5 ESTC supported PC's. As a method to improve the available facilities for student design use, especially at the Senior level, part of the AERC redevelopment has focused on the incorporation of space for major design projects in Mechanical Engineering, and general design computing available to College of Engineering students. At this College Center, Civil Engineering also has separate projects space, and it is expected that students of each department will make use of design computing in the main AERC building.

This proposal requests the ESTC to approve the no-cost transfer of used computer equipment to the AERC to increase the computer design capabilities. The used equipment requested (along with the income "lost" by the ESTC) includes:

- 12 667MHz PIII Tangents ($180 each)
- 10 Sunrays ($238.90 each)
- 9 21" HP monitors ($35 each)
- 1 HP color LaserJet 8500 ($950)

Summed together, the request is equivalent to a **$5,814** request for equipment, or 47% of the total cost (see below).

To complete these computer labs, the Mechanical Engineering Department and Performance Engineering program have purchased and installed the remaining hardware and infrastructure necessary to make this equipment functional and the space attractive and highly useable. The hardware and infrastructure supplied by Mechanical Engineering include:

•	12 17", 1 – 19" monitors	$1,300	new
•	4 switches and cable	$250	new
•	1 Network Router	$1,000	surplus
•	Floor coverings	$650	new
•	Chairs	$700	donated
•	2 B&W HP LaserJets	$600	surplus
•	Sunray server & network equip.	$2000	new
TOTAL Mechanical Engineering share:		**$6,500**	

A view of some of the new Design Laboratory space at the AERC showing the inviting atmosphere and some of the infrastructure upgrades.
In this area there are 3 separate rooms, including a meeting breakout area. Each room is easily differentiated by floor color.

The Red&Blue Room

The AERC has also gone through major Network infrastructure renovation over the past year, funded through ACNS. This renovation has resulted in 100Mbps wired network throughout the main building, as well as wireless capabilities giving complete coverage in, and around the main building. All tolled, with the addition of the proposed computing capabilities, the AERC have 28+ available computing workstations supporting undergraduate activities.

In addition to the request for a no-cost transfer of used equipment, it is also proposed that the ESTC assume the maintenance of these additional student design computing labs at the AERC. This would enable these facilities to be a long-term part of the necessary computing infrastructure, supporting the high quality undergraduate education that has come to be expected at CSU within Engineering. In addition, it would allow students to utilize print credits, etc to support the design project activities that take place at the AERC. Mark Ritschard of ENS provided the following information as an indication of what it would cost the ESTC to maintain the new facility over the long-term:

Capital Equipment value:

17 Computers:	$22,100	
10 Sunrays:	$9,000	
27 19" Trinitron monitors:	$9,450	
2 black & white laser printers:	$5,000	
1 color laser printer:	$4,500	
TOTAL:	**$50,050**	**Annual Replacement: $12,000**

Current annual commitment for AERC lab: $2,100

TOTAL increase in commitment for equipment replacement: *$9,900*

Student wages needed to maintain the facility: $1,000

Annual costs of supporting three additional printers: $4,575

TOTAL annual maintenance costs: $15,475

As the facilities develop at the AERC, the plan is to test and develop the "Design Studio of Tomorrow". Rather than just replacing the current "fixed" machines as they age, this plan involves extensive use of the wireless infrastructure already in place and the potential of the Citrix system that ENS has implemented over the past 2 years. The "Design Studio of Tomorrow" is an exciting new concept, based on full computing mobility using LapTop computers, and potentially PDA's, to untether the Engineer from the desk, or from a fixed "Design Cubical". This is predicated to increase the engineer's productivity and creativity by allowing design and development work to take place in many different types of appropriate environments. Student engineers will be able to undock a LapTop as they enter the facility and head, individually or as a Design Team, to "where the action is". Thus, in the long-term, computing infrastructure at the AERC will change and the hardware proposed to be maintained through ESTC will also change. When fully implemented, the "Design Studio of Tomorrow" would involve roughly 8 – 10 stationary high performance graphics workstations and about the same number of Sunrays, plus roughly 25 Laptop computers with wireless capability.

Mobile Computing as the Basis of the Next-Generation Design Environment

Professor Donald W. Radford, Mechanical Engineering
don@engr.colostate.edu
September 2003

SUMMARY

Unlike present "static" design studios, as in the on-campus Lockheed-Martin area, the planned "Next-Generation" Design Environment will free the designer to move to the locations, other than an actual studio, where hardware is actually being produced, or where testing is taking place. In addition, through the use of a CITRIX enabled network, the designer will be able to access state-of-the-art CAD and analysis tools, running on high performance engineering workstations making up the CITRIX farm, from highly mobile notebook computers, or potentially PDA's. These same mobile computing tools will enable the collection of real-time data and the ability to transfer it across the network.

This "Next-Generation" Engineering Design Environment demonstration project is proposed to be housed at the AERC, where the Performance Engineering program has been established. At this site, over 50 undergraduates will undertake the design and fabrication work relating to their Senior Practicum, each year. Wireless hubs, attached to gigabit fiber optic are already in-place at this 6-acre, 24,000sqft facility. The wireless system includes full coverage inside the complex and coverage over a substantial region outside the buildings, making this a very desirable location to test this new approach to design productivity and education. Thus, by combining the mobility of wireless with the flexibility of the CITRIX farm, it is predicted that significant educational and productivity goals will be realized.

This proposal to the ESTC relates to the initiation of this 'Next Generation" Engineering Design Environment, to which Mechanical Engineering has committed, in advance, to a 1:1 cost share.

BACKGROUND

Throughout Colorado State University wireless network capabilities are now being put into place. Many buildings are wireless enabled; however, at this stage the use is still limited. The overall vision of the role of mobile computing is to enable flexibility in the learning environment, whether the computer interaction is related to classroom learning, is being used in the campus-wide freshmen seminar, or is a part of the highly experiential learning of the major capstone experiences mandated, for Seniors, across the University. Recently, the AERC foothills campus complex, 5 miles west of the main campus, where the new Performance Engineering program is being established, has been connected with gigabit fiber. In addition, a substantial commitment of several wireless subnets that cover the site, both inside and out, has been made. This infrastructure was installed during the summer of 2003.

NEXT GENERATION DESIGN STUDIO

Present approaches to engineering design incorporate "static" design studios, distant from prototyping facilities, fabrication areas and from test locations. Further, the present design environments are often inflexible in hardware set up and in workstation organization, limiting productivity. Thus, an approach that enables individual, as well as group design activities to take place without the single formal "fixed" studio environment promises enhanced productivity. This proposal suggests a mobile, flexible, engineering environment that enables team information transfer in design, research, testing and production to be accomplished, using wireless technology and a CITRIX enabled network. By implementing this activity at the remote campus, evaluation of the effectiveness of the technological approach, as it relates to engineering team interaction across disparate sites (to the main campus), will also be investigated.

The incorporation of this mobile computing initiative to the CITRIX-enabled network means that complex engineering design and analysis tools can be run from any of the mobile devices. However, this approach further means that, independent of which mobile device the student user

chooses, on a given day, the personal environment of the user remains unchanged. The flexibility of this approach means that advanced engineering analysis tools running on workstations within the CITRIX farm can be set in motion from a notebook PC in an engineering area.

Upon arrival at the complex, the student can undock one of a number of notebook PC's from a rack and can go to a test location or to the manufacturing area carrying only the notebook computer, which can be used to monitor the progress of an analysis or to make adjustments to the model, based on new information gathered. Back in the "engineering office area", the student can call a team design meeting, moving into a formal, or informal, meeting area and connecting the notebook PC to an LCD projection system to discuss design changes while projecting onto a whiteboard for illustrative purposes. At the end of the day the notebook PC is returned to the rack, automatically charging and waiting for the next user. The benefits to be realized include enhancements in design education and in student design productivity, as well as an improved awareness of mobile technology by the students involved.

Thus, it is proposed that 1 charge rack of 10 notebook computers be purchased for this technology/education demonstration. 10 notebook computers should adequately handle the initial demonstration plans. Each notebook PC should incorporate an internal wireless network capability to enhance the mobility of the system and should have at least a 15" display so that the student engineer can utilize the machines for CAD work, in addition to engineering reporting. It is further proposed that 2 XGA LCD projectors be purchased. The acquisition of 2 projectors will help ensure that design bottlenecks are minimized.

Based on conversations with Mark Ritschard, of ENS, it is estimated that the cost of the charge rack with notebook PC's plus the projectors will be approximately $15,000. It is proposed that the Mechanical Engineering Department will share the costs of this infrastructure, and therefore, this proposal asks the ESTC to support this Next Generation Design Studio by committing $7,500 from emergency funds. This will allow the technology to be used immediately, in the 2003-2004 academic year undergraduate design projects.

Date: Wed, 24 Sep 2003 11:30:17 -0600
From: Allan Kirkpatrick <allan@engr.colostate.edu>
Organization: Colorado State University
User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.0; en-US; rv:1.0.2)
Gecko/20021120 Netscape/7.01
X-Accept-Language: en-us, en
To: "Mark R. Ritschard" <ritschrd@engr.colostate.edu>
CC: don radford <don@engr.colostate.edu>
Subject: laptops for aerc
X-ECS-MailScanner: Found to be clean
X-Spam-Status: No, hits=-100.0 required=5.0 tests=USER_IN_WHITELIST
version=2.20
X-Spam-Level:

Mark:

I would like to designate $ 7500 of the ME department's tech fee allocation as a match for Dr. Radford's request for $7500 from the college IT committee, so he has $15K for the laboratory laptops.

--
Dr. Allan Kirkpatrick
Professor and Head
Mechanical Engineering Department
Colorado State University
Fort Collins, CO 80523

970-491-6559