

**COMPUTER ENGINEERING PROGRAM
INDUSTRIAL ADVISORY BOARD MEETING
November 12, 2004**

Members Present: Clyde Clark (Alternate for Jim Medieros), Dave Atkinson, Ed Wild, Joel Mellema, Kathleen Marzahl, Kelly McClure, Len Myers, Lynne Slivovsky, Mark Smith, Mike Flynn, Rina Raman, Troy Smith

Faculty and Other Staff: Al Liddicoat, Art MacCarley, Dan Walsh, David Braun, Diana Franklin, Fred DePiero, Hugh Smith, Jim Harris, John Seng, Lynne Slivovsky, Mike Cirovic, Tim Kearns, Lew Hitchner, Richard Fryer, John Saghri

Students: Blong Yang, Eric Firestone, Ken Murthy, Taylor Nohara, Vivian Wang

The meeting commenced at 8:31 am. The attendees introduced themselves and gave a brief biography of their current role. Len provided a brief overview of the day's scheduled events.

Engineering Facilities Progress [Dan Walsh, Associate Dean of Interdisciplinary Studies & Graduate Programs, diagram attached]

Dan Walsh presented current CENG building projects. He discussed the relationship of buildings, faculty, staff and students. He highlighted the various laboratories located within the ATL. Special mention was given to the MTS Hydraulics Table located in the Earthquake Laboratory, the NSF Transportation Lab, Litton Mechatronics Lab, and Northrop Grumman Aerospace Systems Laboratory and the new Bonderson, Engineering III and IV buildings.

Innovation Quest [Mike Cirovic, presentation materials attached]

Mike Cirovic presented the new organization called Innovation Quest. Mike explained it is a nonprofit corporation whose focus will be to develop marketable senior projects. IQ has a liaison board. Mike said as it stands Cal Poly will own the intellectual property. However, there is a revision to be adopted that any intellectual property developed by students through normal coursework will be owned by the students. IQ has a goal of bringing back the excitement into senior projects by providing additional opportunities via the funding mechanism through project profits. There are also plans for a campus technology park, which could be fed by IQ.

Tours

Hugh Smith led members through the Networking Lab and the recently remodeled Computer Science labs.

Defense Advanced Research Projects Agency (DARPA) Project [Dr. Art MacCarley, presentation attached]

Art presented the DARPA Grand Challenge 2005, Team Cal Poly, "Polynator," a race for autonomous vehicles. The technologies involved are interdisciplinary and aligned with the focus of the CPE Program. There are from 30 to 50 enthusiastic students who are ready to meet the challenge. Lynne Slivovsky, Bryan Mealy, Franz Kurfess and John Seng, Art MacCarley and others are involved. The competition is held near Barstow, CA, in the Mojave Desert.

There is a \$2 Million prize offered this year. Art asked that members consider whether supporting this would be in the best interests of their company. Art believes Cal Poly can win with support and estimates the overall budget for the project will be around \$150,000 to do a winning entry, with volunteer student and faculty help.

Sustainability [Dr. Jim Harris, presentation attached]

Jim provided an overview of sustainability issues. Cal Poly signed the Talloires Declaration this past spring. Originally there were 10 signatories, which have grown to 300 universities in 40 countries. Cal Poly joined this group last spring. The infrastructure is being laid for the purpose of teaching the interdisciplinary courses needed to generate the engineers who can facilitate

sustainability. Sustainability will be infused throughout the entire curriculum instead of separated out.

Undergraduate Computer Engineering Curriculum [Dr. Al Liddicoat, Computer Engineering Program Assistant Director, presentation attached]

Dr. Liddicoat presented an overview of the current curriculum with an outline of the current view of future curriculum. Al pointed out that the freshman year consists of 23 units, sophomore 16, junior 25 and senior 29. He distributed "The Computer Engineering Body of Knowledge," a compilation by Lynne Slivovsky of the body of knowledge appropriate for a computer engineering degree. Al introduced items of consideration for future curriculum. He mentioned the increase of abstraction within the curriculum, more project based courses (such as our capstone courses), and multidisciplinary courses. Al would like feedback on the flexibility of courses, such as within the technical elective context. He asked what the content should look like in the future. Areas discussed included:

- Architecting
- Biotechnology (biosystems, biosignal processing)
- Design (portability, compatibility, power (exploit low power), etc.)
- Knowledge of how components work
- Modeling
- Networking (wireless, distributed, etc.)
- Probability
- Productivity
- Programmable Logic
- Reconfigurability
- Simulation
- Statistics
- Sustainability (related to other topics, such as design)
- System Compatibilities
- System Integrity (Security issues (smart dust, etc.), reliability, robustness, fault resolution)
- Systems engineering (risk management, exploration, design, time constraints, etc.)
- Using teamwork to complete system projects

Higher Education

Diana suggested that students need to realize the difference in job opportunities for master's versus bachelor's degrees. One member felt that having two years experience is equivalent to masters. This can be more economical than obtaining a masters degree. However, most members encouraged students to obtain a master's degree. The consensus is that lifelong learning is the key.

Senior Project Presentations

- Taylor Nohara presented his project. He discussed the PIC microcontroller, vibration considerations, image output, discovery process and array design. He encountered the issues of cost, time and sacrifices he had to make in order to accommodate the production of the project (presentation attached).
- Vivian Wang presented the Event Analyzer Tool. She worked in the Cardiac R Management Division in a CoOp at St. Jude. Kelly elaborated on the focus of the heart problems they were trying to detect; it is a limited a set (presentation attached).
- Blong Yang and Ken Merthe presented their electronic sensor glove project.

Evaluation of the Presentation Rubric [copy attached]

Members suggested adding ratings for the appropriate content level, organization, pacing and amount of time. Some members suggested that the items currently on the rubric be weighted. Students need to deliver a problem statement at the beginning. Students need to recognize that people grasp understanding in different ways. Mark said the first speaker did well in his use of the camera and the flash animation by demonstrating his project at the beginning and then

discussing it for the rest of the presentation. Everyone agreed that organization of the presentation should be emphasized.

Len noted that he makes it necessary that students specify in a three shell layer what they must complete, then what they would like to do in addition to that, and an outer layer of how to maximize their project. This is like the must-haves and the wish list. Members indicated that it might be helpful for students to use something like Microsoft Project. The role of the advisor is calling things to their attention in the first quarter and in the second quarter helping direct them to completion. However, not all faculty feel this way. Some faculty feel students should be completely autonomous and be allowed to fail as a learning experience.

Mark Smith wondered if students know how to exploit information resources. Len responded that this would be covered in the technical writing class. Mike was interested in the fact that the students seemed to limit their project to course specific items. Kathleen suggested the rubric be introduced in earlier classes to get early feedback so that students can develop the skills necessary for use in later ABET related evaluations. Len and members agreed that this would be a great idea. Kelly suggested that presenters need to learn that when they appear before an audience they should not assume they understand a question of the audience. Len agreed. He will make a revision of the rubric, email it to members and await their feedback.

Board Membership and Rotation

Rina led a discussion regarding IAB membership and the rotation process. Mike suggested that there be a rotating representative from UC schools such as Berkeley, UCLA, UC Santa Barbara, Riverside, Stanford and San Diego. He would like to see the person be a link to Cal Poly students for higher education. He would like to see this person have a relationship with students, faculty and encouraging higher education.

Kathleen asked what the optimal size is, as originally it was designed to be 15 to 20 members, but we now have 14. Len indicated it would be better to have more members. Len asked whether when we add new people if we should stagger them to have a different link. Rina said this would make sense, to assist in the goal of having one-third of the board turn over every year. Mike said initially this could be designed to some having a one year, some two year and some three year term to facilitate the initial staggered rotation rate.

The consensus is that there is a good representation on the board, with the exception of possibly trying to add an automotive representative. It is important to try and keep a good industry segment representation. Mike said that finding some solid venture capitalists with a technical background, perhaps a retired person, who could bring a practical perspective to the IQ program. Someone with that insight would be able to provide some valuable information. Rina asked that Rhonda put together a list of attendance from past meetings. Mark indicated that an IAB without an attendance requirement doesn't seem to work. It causes too many problems.

The minutes from the previous meeting were unanimously approved.

The next meeting date is tentatively scheduled for May 13, 2005. Rhonda will confirm that date when she sends out the minutes and attachments from this meeting.

The meeting was adjourned at 4:37 p.m.

Respectfully submitted,

Rhonda Walker