

Chairs' & Center Directors' Meeting Minutes

Date: May 28, 2010 (12:00 to 2:00 pm)

Location: EBU II – Room 443

Attendees: Abbaschian, Reza
Balandin, Alex
Barth, Matt
Bhuyan, Laxmi
Boretz, Mitch
Davidson, Don
Lake, Roger
Payne, Tom
Ravi
Schultz, Jerry
Stahovich, Tom
Tan, Sheldon

Absent: Bhanu, Bir
Haddon, Robert
Hartney, Pat
Mahalingam, Shankar
Matsumoto, Mark
Najjar, Walid
Parker, Linda
Yan, Yushan

The agenda for the meeting is shown in Appendix 1.

1. Welcome and call for agenda items - Reza

Reza distributed a breakdown of student/faculty ratios by college at UCR. BCOE is second-lowest; GSOE is lowest. BCOE's average is 11.53 and ranges from 7.05 (Bioengineering) to 16.47 (CSE).

2. Approval of Minutes - Mitch

The revised minutes of the May 10th Chairs/Directors meeting were unanimously approved.

3. Commencement - Don

Don is planning a heck of a party. A web site has been established asking students to RSVP. We have more than 110 students already RSVP'd there, and we are anticipating approximately five guests per student. Room assignments are being determined. Food is not yet ordered.

The UC labor dispute could mean we will have pickets at graduation. Robert Brown is concerned about this but confirmed that he will attend.

4. Academic Planning

Bioengineering:

Jerry believes COE should be the health technology leader of the campus. Seven of 10 U.S. growth professions relate to health. There is potential to work with industry and government agencies, particularly NIH. We have health-related faculty in several BCOE departments (about 25% of BCOE faculty does work related to health). This concept also relates well to the strategic themes identified in the UCR 2020 documents: next-generation technologies and mind and body. Research areas include imaging, artificial cells, smart drugs, computation/informatics. Proposed centers:

- Center for Artificial Organs and Medical Devices. Can include bio-hybrid organs.
- Bioengineering and High-Throughput Screening and Drug Design Center.

Discussion: Laxmi sees good overlap with bioinformatics in computer science. Also envision a master's program in bioinformatics. Ravi says Dean Olds of School of Medicine sees promise. Matt Barth asks what makes us unique in UC system? Jerry says there is room for us regardless of what other campuses do. UC system has a lot of strengths, but we have opportunities in the areas that Jerry identified – and we can be the leader on this campus.

Computer Science and Engineering

Laxmi has two proposals: Center for Healthcare Informatics. There are two existing tracks in UCR: one in bioinformatics in genetics, genomics, and bioinformatics, and bioinformatics track in Biological Sciences. CSE faculty would like to create a master's program in bioinformatics, which is something not available on campus now.

Second, CSE proposes video games as an area of emphasis. The demand is great, especially in Southern California. Several campuses have created formal programs. UCR's current courses pertaining to games are full and have waiting lists. Classes can be cross-listed in CHASS. We have only one professor in this field, and we would need more.

Third, a research emphasis cyber-physical systems: combining engineering and physical disciplines with computers. This can involve faculty from many departments. We would need some specific themes since cyber-physical systems is so broad.

Discussion: On bioinformatics, Jerry was thinking about a research orientation, not degree programs. Campus obviously is interested in the funding potential of any new initiative. Laxmi says the program can attract more grad students and faculty. Reza acknowledges that initiatives aimed at students rather than hot research topics will have a harder time getting campus support.

Bioinformatics generally refers to genes and what we can learn from them. We can apply a different name to the CSE concept to make it more broadly based.

Ravi says there is a “healthcare information technology” working group that meets once a month locally.

On the game idea, Tom points out that games are a great context for research on natural/computer interfaces. Beyond Victor Zordan in CSE, other expertise that pertains to video games comes in interfaces and graphics. Image processing is also relevant. Maybe connect with Media and Cultural Studies.

On cyber-physical systems, Matt Barth points out that intelligent transportation often is being included in this broad area now. This means we have the potential for collaboration between CSE and CE-CERT. Embedded systems also would be an area to develop under this banner.

Electrical Engineering

Roger had computer problems. We made fun of him.

Major applications are medical applications, homeland security, energy, 3D electronics, and computational materials. All are related to existing centers on campus: CRIS, UC-Light, CNSE, or CE-CERT.

Medical topics can include micro/nano-robotics that operate inside the body (Mourikis); medical electronics such as systems on a chip (Wang, Tan); bioimaging and informatics building on the strengths of CRIS and encompassing lab on a chip; and sensing.

Security and surveillance can include large-scale, networked intelligent image recognition systems (CRIS), where we are a world leader already. The methods for imaging (optical, microwave, IR, etc.) and image recognition fall under this umbrella. In sensing, we have sensors for medical and security/surveillance applications, MEMS/NEMS, IR and THz sources and detectors, and lab on a chip.

Energy includes UC-Light (solid state lighting, smart grid, optical design for beam control) and hybrid vehicles, and solar energy.

3D electronics builds on CNSE: devices, materials, integration, system design, and circuit and system design methodologies.

Computational materials fits with solar and integrated circuits. By a stretch, it can connect to computational biology. This is a growth area, and much of the work is computational rather than experimental.

Discussion: MEMS has connections to Mechanical (Rao, C. Ozkan). CEE has experts in nanofluidics/lab on a chip (Chen, Mulchandani, Myung).

Rather than saying hybrid vehicles, we should say energy systems, which can be applied to transportation, grids, etc. Energy is a broad field and would be of interest to faculty in all departments.

Mechanical Engineering

First area we looked at is air pollution modeling. ME is very strong in urban air pollution modeling and has unique expertise in experimental and theoretical (Princevac, Venkatram). The opportunity is in regional-scale modeling, but we need expertise in computational modeling of chemistry and physics at this scale. We can become a national leader in multi-scale pollution transport. Good potential for collaboration with CE-CERT, CEE, Environmental Sciences, and the UCR 2020 plan (nature, energy, environment, sustainability).

Second is biomedical devices. Research opportunities and career possibilities here are very strong. ME envisions emphasis on diagnostic and therapeutic methods: a bridge between fundamental, mechanistic studies and clinical practice. We need expertise in design, modeling and manufacture of biomedical devices; mechatronics; clinical translation/commercialization; and biomechanics. We need to establish

Discussion: We don't have strengths in global climate, but we don't need that to succeed in the pollution transport concept as described here.

Materials Science and Engineering

Nanotechnology, carbon materials, materials for electronics, materials for energy generation and storage (PV, solar thermal, thermoelectrics), Dirac materials (topological insulators and 2-D materials), materials for medical applications, THz sources and characterization, and computational materials.

There is potential link to animation in modeling the performance of these materials.

Discussion: MSE needs to stay close to departmental priorities and can provide a natural umbrella for research and educational initiatives in any of these fields.

Collaboration with national labs can be pursued.

Another idea is to connect engineering and business students and research to commercialize concepts.

CE-CERT

CE-CERT envisions "centers of excellence" in alternative fuels emissions, advanced biofuels, atmospheric chamber (research facility), transportation system-based vehicle management, and solar energy.

In alternative fuels and emissions, the needs are in engine technology and life cycle energy systems and greenhouse gas analysis.

In advanced biofuels, the needs are in plant genetic engineering, biomass catalytic processing (drop-in fuels), carbon capture and sequestration, and greenhouse gas analysis. In the intermediate terms, we will need a successor to Charlie Wyman, who will reach retirement age.

In carbon capture and sequestration, the needs are in plant genetic engineering, biomass catalytic processing, carbon capture and sequestration, and greenhouse gas analysis.

For an atmospheric chamber, our needs are in atmospheric regional modeling focused on particulate, atmospheric particulate mechanistic modeling, life cycle energy systems and GHG analysis, and research instrumentation development.

On transportation, needs are in distributed sensing and control, communications, and vehicle energy management systems.

In solar, we have a lot of good expertise, but our needs are in photonics (light concentration), smart grid systems, and energy conversion and storage.

Chemical and Environmental Engineering (presented by Reza)

Air, water, energy, and sensors are the areas of strength. Would like to hire people in energy, air/climate modeling, water, polymer materials. 20 faculty by 2013.

Follow up: 3-4 page, high-level proposals (no budgets)

Jerry: health technology..

Yushan: energy systems, including power electronics, solid state lighting and communications (UC-LIGHT).

Matt: CE-CERT Institute.

Tom and Matt: air pollution (Tom will solicit Venky).

Bir: gaming, homeland security and imaging.

Robert: carbon and 3D electronics.

Alex: computational materials.

Laxmi: cyber-physical systems.

Proposals should identify existing strengths and synergies, as well as areas where faculty are needed, internally or externally. Suggest faculty from other colleges, but don't solicit their support yet.

Reza will send letter to faculty by end of next week (June 4). Proposals are due two weeks after that (June 18).



Chairs' & Center Directors' Meeting

May 28, 2010

Agenda

Engineering Building Unit II – Room 443

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| 1. | Welcome - Request for Agenda Items from the Floor | Reza |
| 2. | Approval of Minutes from May 10, 2010 Meeting | Mitch |
| 3. | Commencement | Don |
| 4. | Academic Planning | Chairs/Center Directors |
| 5. | Other Matters | |

The next scheduled meeting will be

Monday – June 14, 2010

Please note: Meetings will be held in EBU II – Room 443