Industrial Advisory Board (IAB) Meeting Minutes

Friday, April 14, 2017
Lory Student Center Grey Rock Room


ECE department: Edwin Chong, Andrea Leland, Tony Maciejewski, Olivera Notaros, Sudeep Pasricha, Ali Pezeshki, Melissa Reese, HJ Siegel, Katya Stewart-Sweeney, Sid Suryanarayanan, Karen Ungerer, and a small group of ECE students.

Guests: Tom Siller, College of Engineering Faculty and RED Professional Formation Thread Champion.

New members: Dave Christie, Advanced Energy; Steve Pacheco, Woodward.

1. Introduction and Welcome IAB Guests (Lance Guymon, IAB president)
   Steve Martin opened the meeting, welcomed the new IAB guests (outlined above), shared the day's agenda, and then turned it over to Tony Maciejewski, ECE department head, for the department update.

2. Agenda and Department Update (ECE Department Head Tony Maciejewski)
   Tony welcomed the meeting attendees and delivered an update on the department, touching on the following topics:
   - 10 years of service to the IAB: Dana Kirchmar and Scott Makinen
   - The department’s latest fellow awards
     o Carmen Menoni, AAAS
     o Branislav Notaros, ACES
   - ECE receives radar gift from Vaisala
   - Recent breakthroughs
     o Conditions inside stars recreated with compact lasers (Rocca)
     o Groundbreaking visualization of cell membrane interactions (Krapf)
     o Microscope built with 3-D and high-resolution image processing (Bartels)
   - ECE wins big at college awards ceremony
     o V.N. Bringi, Meritorious Faculty Emeritus
     o Tom Chen, Abell Outstanding Economic Development
     o Olivera Notaros, Abell Outstanding Teaching and Service Faculty
     o Melissa Reese, Outstanding Administrative Professional
     o Liuqing Yang, Art Corey Outstanding International Contributions
   - Alumni and development news
     o Carl Wilmsen ECE Scholarship endowed
     o CSU’s largest gift in history renames college – Walter Scott, Jr. College of Engineering
   - Recent alumni features
- Susan Benzel leading “The Machine”
- Ian Bernstein creator of popular Star Wars BB-8

- Upcoming events
  - Annual Best Paper Contest in June
  - Commencement set for Friday, May 12

- Charts and data
  - College of Engineering research expenditures
  - ECE research expenditures
  - ECE direct and indirect costs
  - Proposal activity
  - ECE student credit hours
  - National enrollments by discipline
  - CSU engineering enrollments
  - Biomedical dual majors
  - ECE spring enrollment
  - Nontraditional undergrads in ECE
  - First-generation undergrads in ECE
  - Freshman enrollment
  - Freshman admissions outlook
  - National persistence in engineering
  - ECE freshman retention rates
  - Women in engineering (FA16)
  - Women in ECE at CSU
  - Undergraduate degrees awarded
  - Graduate degrees awarded
  - Percent of international degrees awarded

- Career outlook for ECE grads
  - Among top 10 majors in demand for B.S., M.S., and Ph.D. degrees
  - Average starting salaries
    - Electrical engineering - $75,000
    - College average - $58,441
    - CSU average - $47,948

- College degrees ROI

- Early Results of RED
  - Anecdotally, LSMs and KIs well received
  - Number of students receiving Ds, Fs, or withdrawals in technical core has been cut in half (FA16 vs FA15)
  - Engineer in Residence a success
  - Increases interest in student projects throughout curriculum

- Status of M.S. & Ph.D. in computer engineering
  - Program launched and open for enrollment
  - Adding new faculty member in fall

- Reminder: New ECE certificates available
  - Computer Systems Engineering
  - Embedded Systems
  - Power and Energy

Update on fall items:
- **Action item**: Continue to emphasize and expand K-12 outreach.
• **Status**: Karen Ungerer leading outreach for ECE – successful high school counselor event held last month.
• **Action item**: Provide status of ECE branding effort.
• **Status**: Key topic of ECEDHA annual meeting
  - Andrea serving on nationwide communications team.
  - Tailfin Marketing hired to conduct focus groups and develop brand.
• **Action item**: Share opportunities to raise cultural awareness.
• **Status**: Leveraging CSU organizations to connect ECE students with multicultural programs and opportunities.
  - Friday Afternoon Club
  - Culture Café Series
  - Study Abroad
  - Engineers Without Boarders
• **Action item**: Explore idea of geographically dispersed teams.
• **Status**: Currently incorporated in VIPs; pursuing internationally dispersed teams.
• **Action item**: Provide assessment to evaluate students’ skills beyond technical abilities.
• **Status**: Sharing idea of student portfolios during professional formation thread update.
• **Action item**: Continue to provide enrollment data for entire College of Engineering.
• **Status**: Now included in IAB presentation each semester.

3. **Professional Formation Thread Update (Tom Siller, Engineering Professor)**
Tom Siller spoke about the work underway as part of the professional formation thread, including an effort to create electronic portfolios to showcase and archive student work. He emphasized the importance of constant communication with the IAB to continuously improve the thread.

4. **Engineer in Residence (Richard Toftness, Engineer in Residence)**
Richard Toftness provided an overview of the Engineer in Residence program, a highly successful partnership with the IEEE that brings practicing engineers to campus to mentor and advise students. Because of its popularity, there is a waiting list for the program. Looking ahead, Richard said he would like to use analytical data to see if the EiR program is impacting: 1) attrition rates at CSU, and 2) the performance of ECE new hires in industry.

5. **Prep for Engineering Days (Tony Maciejewski)**
• The Creativity Thread
  Components of the thread:
  - Thread Champion: Olivera
  - Vertically Integrated Projects – partnership with Georgia Tech
  - Open Option Projects at all levels
  - Research Experience for Undergraduates (REU program)
  - Senior design
  - Continuity of optimization tools
• Industry Involvement in Creativity Thread
  - Industry-sponsored projects (senior design, 202, OOP, VIPs)
    - Technical involvement
    - Financial sponsorship
  - Individual involvement in projects
    - Written and oral communications support
    - Coaching/mentoring via senior design or EiR program
    - Reviews of senior design reports for Best Paper Contest
Judging oral presentations and project displays
Classroom engagement through interactive sessions or lectures

Feedback on Creativity Thread: After hearing more about the RED project, the board was interested in learning about data being collected and baseline measures for RED.

- Considerations for E-Days
  - Can you tell a difference between projects (industry vs faculty led vs service oriented)?
  - How are we doing overall?
  - Which projects stand out, and what makes them great?
- Assessing professionalism in projects
  - Complete enclosed rubric to build on SP16 baseline
  - Acceptable to use “n/a” or “.5” in your ratings
- Results of SP16 baseline assessment of professionalism in senior projects

6. Breakout Session: E-Days Review & Homework (Facilitators: Steve Martin and Art Lizotte)

   Homework:
   - How do you design your internship programs, and what traits do you look for in interns?
     - How can we create student experiences that emulate your successes?
     - How can we improve our practices to ensure our graduates possess the traits you desire?
   - What are the demographics of your organization and/or work group?

   E-Days Feedback:
   - Could you tell a difference between projects – industry vs. faculty led vs. service oriented?
     - What are the pros and cons of the different types?
     - What’s missing, if anything, in our projects?
   - How can industry deepen involvement in student projects?
   - Did you speak with a student today that you would hire? If so, why?

Key Points and Suggestions:

Comments about projects:
- The board could see a difference in projects receiving significant funding or corporate support; they noticed a stronger corporate presence overall.
- A few board members are not as impressed with the big, multiyear projects and thought they seemed more narrowly focused. With such projects, they wonder if students get the opportunity to be truly creative. Some board members wanted to know details about how we’re challenging students involved in the “mega” projects.
- To address concerns related to big, multiyear projects, the board made the following suggestions:
  - Have students clearly delineate multiyear projects on their posters to help reviewers understand the scope.
  - Ask incoming teams to document the current status of their multiyear project, along with goals for expanding the project over the course of the academic year.
- Many believe that testing must be built into project schedules, as it’s a necessary part of the iterative engineering process.
- They noted that professionalism skills are somewhat hard to judge in a venue like Engineering Days.
- On the whole, the IAB feels that students’ communication skills have improved dramatically over the years (the person who made this observation has been on the board for 12 years).
• In talking with the design teams at E-Days, many students told board members that they interacted with EiR volunteers as part of their undergraduate experience.
• The board was impressed with students who exuded passion and could explain why their project matters; they thought that self-directed and service-oriented projects seemed more passionate than others.
• One person mentioned that students need more project management experience and suggested making project management tools available to teams.
• Many teams struggled with the question, “Who is your customer?” The board said that requirements gathering could address this.
• In the future, the IAB suggested distributing a list of projects for the upcoming academic year so that board members can see the breadth of projects and determine which ones they might want to sponsor or mentor.

7. Election (Art Lizotte)
The board unanimously voted in favor of Jeannine Looney (Medtronic) to serve as the IAB vice president for the upcoming academic year; Art Lizotte becomes president.

8. Closing Remarks (Tony Maciejewski)
Tony wrapped up the meeting and thanked the board for their participation. He encouraged the board to contact him or Andrea with additional ideas or comments regarding the meeting topics.

ACTION ITEMS:
• Ask incoming teams to document current status of multiyear projects and goals for expanding the project.
• Multiyear projects should be clearly delineated to external audiences; current team’s contributions should be evident.
• For mega projects, ensure all students are being challenged and afforded the opportunity to be creative.
• Knowledge transfer should be a component of every project; customer and project requirements should be documented.
• Provide a list to the IAB of potential senior design projects to sponsor, mentor, or serve as a customer.

The fall IAB meeting is scheduled for Friday, November 3, 2017.