Cal Poly Pomona

Computer Science Advisory Board Meeting

Restaurant at Kellogg Ranch

April 26, 2004

Attendees

Elizabeth Kay-Im, JPL

Gene Price, Jazz Semiconductor

Marcus Dee, alumnus (B.S. 1996)

Robert Kerbs, Barry Soroka, Chung Lee, Mandayam Srinivas, CS Department

Meeting Notes

Industry Trends

- JPL has noted that the market has tightened giving employers a better selection of job candidates. However, with JPL's recent Rover success the organization is busy – not only for supporting current projects but for follow-on projects in the 2005-2009 time-frame.

- Jazz Semiconductor is doing well– an Initial Public Offering (IPO) seems to be in the works and their fabrication facilities are working at maximum capacity. A Cal Poly student intern was hired with good results.

Job Training

- There seems to be good success with JPL's Academic Part-Time (APT) program. Recently, two students were hired into it (one from Aerospace and one from Mechanical Engineering). A comment was made indicating that one of the positions might have been better served with a CS student.

- JPL's APT program recruits from USC, UCLA, CSUN, and Cal Poly.

- The APT program works best with at least a one year commitment by students indicating that sophomore and junior CS students should start thinking of applying far enough in advance to be considered. This seems to be a preferred method of bringing new employees into full-time employment at JPL.

Skills

- Most APT software work involves reworking and understanding existing code. As they become more experienced, the design engineers give them more demanding/creative projects.

- The Java documentation tool Javadoc could be utilized to a greater extent in our classes. This practice could perhaps instill better systems understanding of a given application.

- Students don't seem to understand three issues that define a project's success: funding, time, and resources (people). In other words, students like to design projects based upon what their interpretation of what is good and bad, not fully comprehending the constraints, limitations, and politics of why certain decisions are made. It was thought that this issue could not be taught directly but by (1) getting students working together and (2) Cal Poly participating in programs with industry, students might gain an understanding of some of the relevant issues.

- It was suggested that students complete one larger scale project involving software utilized in industry. The idea is that this experience might make the difference between getting a job and not. Soroka noted that our budget does not permit purchase of much commercial software. Perhaps this could be accommodated with collaboration with a company that makes the software.

- Instructors who give group assignments should meet with the group periodically to ensure good decisions are being made and that everyone is pulling their weight.

Alumni Interaction

- There was a lengthy discussion about Cal Poly's alumni database and how useful it could be if access were provided more easily than in the past.

Industry Interaction

- The board thought it useful if the CS Department participate with other departments that have outside industry projects (like Mechanical Engineering and Aerospace) – this being another approach of providing students with the opportunity to get real-world experience.

- It was suggested that technical seminars should be given so that industry representatives could share their own unique experiences and answer specific student questions.

- Some companies have a human resources department that specialize in working with universities and recruiting. These entities frequently participate in on-campus job fairs. It might be useful to find out who some of these companies are and try to see how we can work closer with them.

Suggestions for Program Improvement

- Promote internships positions after the sophomore year. It appears several employers are using internships to ensure quality hires.

- Work with companies who make large software packages so that our students might become more aware of what software is being used in industry. In addition, students might gain experience by completing a large-scale project utilizing one of the software packages.

- Increase the utilization of Javadoc in courses.

- Work directly with industry by locating projects that could be completed by students in a reasonable amount of time.

- Work with other departments and/or schools who already have industry projects set up.

- Encourage instructors who give group assignments to meet with the individual groups.

- Locate our alumni by either using the University's database or developing our own. Enlist them in department activities.

- Conduct technical seminars that bring in outside company representatives on a regular basis.

Cal Poly Pomona

Computer Science Advisory Board Meeting

Restaurant at Kellogg Ranch

May 3, 2004

Attendees

Ric Belding, Director of Project Operations at Odetics Broadcasting; alumnus (B.S. 1989)

Robert Kerbs, Barry Soroka, CS Department

Meeting Notes

Industry Trends

- There seems to be a trend by management to utilize off-the-shelf software for systems integration. However, it was noted that computer science professionals are needed to make good decisions based upon the foundations upon which the software can be used.

- Odetics Broadcast is winding down operations. Junior level engineers/scientists have already been let go.

- Despite a difficult job market Mr. Belding indicated that there are opportunities for recent graduates due primarily for economic reasons (i.e. new hires are paid less than experienced workers).

Skills

- New hires need to learn to work in a team environment, however, it was noted that this is difficult to instill in a classroom environment.

- Students should understand foundational computer science theory and system integration. There shouldn't be an over-emphasis on one specific programming language over another. In this respect it might be useful to create a class that does no implementation but simply the tops-down design of the system.

Alumni Interaction

- It appears that Alumni Relations keeps in touch with Mr. Belding on a two-month to three-month cycle. This contact is in the form of phone calls soliciting monetary donations.

Suggestions for Program Improvement

- It might be useful to take a completed medium-sized software project and have a class re-design it. The idea would be that the students could be introduced to the issues experienced working on larger projects work.

- Think about having two sections of the same class work together to solve a larger problem.

- Conduct technical seminars that bring in outside company representatives on a regular basis.

Cal Poly Pomona

Computer Science Advisory Board Meeting

Restaurant at Kellogg Ranch

May 10, 2004

Attendees

Byron Darrah, Senior Security Engineer at United Online; alumnus (B.S. 1994)

Robert Kerbs, Craig Rich, Mandayam Srinivas, CS Department

Meeting Notes

Industry Trends

- India is utilized for United's call center and some software development. It works well to farm out work to places like this because the labor cost is low. With that said, whole projects cannot be shipped overseas as the workers typically don't have the project management / software engineering skills to see a project from idea through to production. We should make students aware that the education they are getting at Cal Poly is giving them those skills that cannot be shipped overseas.

- United utilizes a grass-roots approach to software development. If off-the-shelf software is available that will fulfill the design specification that is needed, and it is priced accordingly, United will use it. However, if the cost of the software does not match United's budgetary requirements, in-house software is developed.

- United's hiring process is rigorous. It consists of one phone interview with a senior engineer. If the candidate seems to possess the required skills s/he is interviewed by the senior engineer's supervisor (another phone interview). If the candidates makes it past this point s/he is brought in for a face-to-face interview. New hires have about six-months to become productive.

- New graduates find it shocking to work with people who possess skills in other areas than CS – CIS, Certified, etc. In the long run this situation does bode well for the CS major as they have a better understanding of the fundamentals required for project completion and understanding.

Curriculum / Skills

- Mr. Darrah was a Cal Poly CS graduate from 1994. It was encouraging to see that he recommend that we move software engineering and computer networking to

our core course requirement list. These changes were made in Fall, 2003 and facilitated by prior assessment analysis.

- Mr. Darrah let us know that it is difficult to find people in the market-place that are well versed in the architectural details of J2EE and .NET – both of which are used today.

- It was suggested that students become proficient with *structured scripting* (i.e. Perl, Bourneshell, and PHP) – that is, scripting that has logical organization to it. As it stands now, even employees who have learned structured and object-oriented programming languages tend to not utilize the foundational skills learned in those environments when asked to utilize them in a scripting environment.

- Students should possess a strong background in data structures and algorithms and other foundational concepts in computer science. It was thought that the rest cannot be learned directly by school alone.

Alumni

- United hired Darwin Macatiag as a new hire from our CS department last year.

Suggestions for Program Improvement

- CS faculty should make students aware that the education they are getting at Cal Poly is giving them those skills that cannot be shipped overseas.

- CS instructors should encourage students to develop a strong interest in a topic specific to computer science. It is not realistic to think that one would earn a CS degree with the sole purpose of making a lot of money – successful new hires have a passion for something within CS and it shows.

- It was suggested that group projects would be useful. Three or four student teams should be required to come up with a design requirements document including testing, how the system will be built, time-frames, as well as other salient questions. Milestones should be set and checked along completion of the project.

- The CS department should continue to emphasize the foundational elements of computer science like data structures and algorithms. Do not become too reliant on a specific piece of software to teach foundation concepts.