Computer Science Department
City College of San Francisco

Minutes of Industry Advisory Group Meeting

Thursday May 4, 2017 | 6:30 – 8:30 p.m.
Batmale Hall room 453, Ocean/Phelan Campus

Attendees:
Craig Persiko, CCSF CS Department Chair
Aaron Brick, CCSF CS Department Faculty
Milica Barjaktarovic, University of Hawaii, CS Department Faculty
Emily Stefiuk, City of SF OEWD, Sr. Workforce Development Specialist
Orrian Willis, City of SF OEWD, Sr. Workforce Development Specialist
Brian Carlo, Product Manager at Workday, and CCSF Alumnus
Kimberly Honciano, IT Manager at San Mateo County Probation Department
Timothy Hastings, CCSF Student
Harold Mann, President, Mann Consulting
Sean Kelly, Database Engineer at Zenefits
Katherine Moloney, IS Business Analyst Sr. at Port of SF, City of SF, and CCSF Alumna
Bryce Lelbach, Software Engineer at Lawrence Berkeley National Lab

Summary of Common Themes and Action Items for CS Department:

- We should infuse the following technologies and practices throughout our curriculum:
  - Github or other online repositories / version control (for turning in homework?)
  - Cloud tools such as Amazon Web Services (AWS)
  - Project-based Learning
  - Test driven development
  - Encourage students to build projects they're passionate about, post them publicly, and be able to discuss them
- We should develop a course on technical interview preparation
- We should consider changing our “Computing Skills for Scientists” certificate to be focused on Data Science, including choice of Python or R (instead of Perl). The most important topic here is Data Visualization.
- Perl should be removed from Web Application Programming Certificate
- Our database certificates can be collapsed into one, with one intro SQL course including NoSQL, one database programming course, and database administration made an optional elective, with data visualization as an alternative

Agenda / Minutes:

6:30 Mingle and have some pizza / snacks

6:00 Agenda Review and Introductions

6:45 Computer Science Department Overview

- We are fully accredited for the next 7 years
- CS curriculum includes programming, databases, Unix/Linux
- CNIT is separate: Web (including HTML/Javascript), Networking, Windows, Tech Support
- User Interface, Experience, and Graphic Design is separate as well, under Visual Media Design.
- CS has:
    - We serve over 2,500 students each year.
    - We offer approximately 30 different courses each semester, for a total of approximately 70 sections.
    - We have 9 full-time faculty and 16 part-time faculty
    - We plan to hire more part-time and full-time instructors in the coming year.
- A list of all the current CCSF Certificates and their SLO's was handed out with the agenda.

6:50 Introductions

7:00 Courses and Certificates

Do these curricula meet your organization's needs for entry level positions? What skills are missing?

Existing:

Programming & App Development: Java, C++, iPhone, Android, Web

Katherine: iPhone/Android programs should cover whole stack, holistic model: "Make a whole working app." Project classes should involve going to hackathons, of which there are a lot. Create technical interviewing course.

Bryce: Single most important factor is an applicant's GitHub account: "can go a long way." Growing demand for full-stack engineers who understand whole ecosystem. JavaScript is essential for mobile space. Test-driven development.

Katherine: Obective-C may now be missing, since legacy code is still in use.

Harold: Adding courses to the certificates will make students more qualified. CCSF students may bring less entitlement than other applicants.

Bryce: Some companies want specialists, and some generalists (Google).

Craig: We specialize in specialization.

Sean: Job tolerance / durability varies quite a lot. Finding out about students' target jobs and desires, is cheaper than inflating the certificates. Perl is ancient, prefer JavaScript. Databases are no longer hard to install, so MySQL may not justify a certificate any more; its SQL is almost the same as SQL Server. NoSQL is missing. Unity for mobile is useful.

Brian: I hold two of these programming certificates. Project-based learning is most rewarding and there should have been more of it; aids technical interviewing. Integrating programming assignments with database is almost a no-brainer. JavaScript should not be missed.

Bryce: Java and C++ certificates are much broader than the others. What job is it really aimed at? How about a System Programming Certificate, less focused on language and more on job? You shouldn't teach programming languages so much as skills.

Katherine: CS skills are embedded in programming language courses.

Craig: C++ and Java certificates are more tightly aligned with transfer curriculum.

Kimberly: We don't hire for career programmers, but term positions. Mobile app development is big in law enforcement; possibly leaving Apple devices behind for security, price, support reasons.

Brian: Lots of overlap between certificates.

Bryce: JavaScript is everywhere.

Harold: Junior developers don't get to work on security problems.

Sean: Interview prep should be an a la carte course as well as part of certificates.

Linux Administration: I, II

Katherine: Interview prep could be broken into two halves. Linux Administration should include Docker, possibly AWS; Students could go to AWS Loft for extra credit. Cloud/containerization topics are major.

Sean: Terraform is also important.

Harold: Cloud/containerization is now costless to learn; start as early as possible (Linux

Administration I).

Katherine and Bryce: Cloud computing and AWS are key. Experience launching on AWS could replace CS 260P

Build Automation for DevOps & QA

Harold and Bryce – this looks great

Katherine: 260A puts students at a professional level. Cloud computing as above could be more valuable than 260P as it stands. 260A should be in Build Automation Certificate.

Sean: QA work now includes Project Management component.

Aaron: CS 177 covers Project Management

Computing Skills for Scientists

Sean: CSforS needs R language. Python is okay too.

Mongo + R – NoSQL, Data Science

Bryce: CSforS should not require MySQL per se, any database will work.
Nix the Perl, replace with R.

Katherine: CSforS should include a project class, leveraging existing packages for science.

Sean: Embedded systems and sensor integration are important again. Internet of Things.

Existing Database Certificates: Oracle, MySQL, SQL Server with C#

Proposed:

Database Certificate revisions

Proposal to simplify our database curriculum to have just the following courses:

- Introductory SQL, taught using MySQL
- Databse Design and Programming (stored procedures, triggers, transactions, etc) taught using Oracle
- Three Database Administration courses: one for MySQL, one for Oracle, and one for Microsoft SQL Server
- C# and other programming couses would remain unchanged

Katherine: Jobs exist around Oracle SQL, especially in C&C of SF.

Sean: Recommend unified SQL course; save PL/SQL for advanced class. No one is using stored procedures in MySQL. In Microsoft SQL Server some people use stored procedures. But in Oracle they are definitely used.
DBAs can become scaling experts as their career develops. DB certificates should cover NoSQL, which does not warrant a whole course. (E.g. JSON, Data Dictionary, etc.)

Katherine: Cultivating network of internships is "an easier way of getting jobs."

Sean: Administration may not be a requirement; production engineers avoid addressing DB permission issues.

Kimberly: Our staff do administer and manipulate databases.

Katherine: DB administration classes should cover cloud issues.

Harold: Teach machine learning instead of DB administration.

Sean: How about DB I, DB II certificates? Part II would contain administration, backups, cloud, EXPLAIN, indexing. "Administration" may be too narrow.

Data Science Practitioner

- Measurement & taxonomies
- Processing & formatting
- Storage modalities
- Descriptive statistics
- Visualization
- Monte Carlo sampling
- Inferential statistics
- Overview of learning techniques

Bryce: It would be good for DS practicitioners to know about major APIs: tensorflow, numpy, etc.

Brian: Don't assume that graduates would get work. Even applicants with Masters can have trouble getting these jobs.

Sean: Candidate pool has ballooned; "extremely competitive". Executives may be mistaken about how much they are going to learn from hiring a data scientist.

Brian: DS skills are useful; combine with project-based courses. Visualization is "huge".

Katherine: Is DS curriculum really the project part of the CsforS certificate? Rather than aiming at DS jobs themselves, many students are best served by getting into the best workgroup possible, using these skills.

Bryce: "There is a lot of excessive hype." Every large company is doing ML, though. Combine it with Computing Skills for Scientists.

Sean: R is a must; Tufte is "the book" for visualizations. Viz should be available a la carte.

Brian: JavaScript and D3 are crucial for visualization.

Sean: The sciences love R and expect applicants to know it. Python is useful too.

Bryce: Python is more widely useful across fields.

Kimberly: Research & storytelling with data is the essential counterpart to analysis. We have to hire two employees here (analyst, IT) and one would be preferable.

Brian: Add "ethical use of data" component to DS curriculum. "How could I be affecting society?"

Bryce: Lots of legal requirements in data space.

Harold: "Insights are where the magic happens."

Brian: Build these skills into other classes.

Miscellaneous:

Sean: Have you considered establishing a group of student consultants?

Bryce: In a 3 month internship, the student gets something out of it; in a 6 month internship, I might get something out of it.

Brian: Change from "Web Application Practicum" to "Awesome Hacking Class"!

Brian: Class timing can be a problem and should be a priority. Online classes are a good solution.

8:20 Exploration of Ways to Get Involved with the Department

8:30 Adjourn

Comments received via e-mail:

---------- Forwarded message ----------
From: Marco Casalaina <marco@casalaina.net>
Date: Fri, Apr 14, 2017 at 11:12 AM
Subject: Re: City College Computer Science Industry Advisory Meeting Invitation, plus We're hiring an Employment & Training Specialist!
To: "Craig A. Persiko" <craig.persiko@mail.ccsf.edu>

Craig,

Great to hear from you and I hope you're doing well!

Unfortunately I have a conflict on that evening so I'll be unable to attend.

What I would say there though is that if you're not already doing this, you're going to need to add an intro to machine learning to your curriculum. I'm now VP Products of Salesforce Einstein so I'm in it all day long, but so is everyone else, so understanding the basic tenets of machine learning, the data preparation for it, and the benefits and drawbacks of the various types of algorithms would be key.

Sorry I'll miss it this year!

---------- Forwarded message ----------
From: Ron Lichty <ron@ronlichty.com>
Date: Fri, Apr 28, 2017 at 4:50 PM
Subject: Re: Agenda and Details for Thursday's Meeting of Industry Advisory for City College Computer Science
To: "Craig A. Persiko" <craig.persiko@mail.ccsf.edu>

Craig,

I'll likely not be there next week, and your programs sound reasonable, so let me suggest how to make those programs more relevant, and your graduates more skills-marketable.

I'll put in my usual plug for agile, but even more so. Not only are teams more frequently exclusively agile, but last year I saw my first team that not only interviews for agile understanding and experience but rejects all candidates who can't match that.

Agile is becoming a baseline, not just a nice-to-have. With the exception, I think, of DB development, where scrum is less practiced, to date, but every bit as applicable, making any experience/understanding a leg up for your graduates.

If you want to get ahead of the curve in agile, make sure your teams not only work in teams using scrum practices, principles and values, but leverage XP practices like TDD (unit tests

written before the code they prove) and BDD (starting with a behavior-description language like cucumber not only eases programmers into TDD but gives them a one-up for customer-friendly communication ability).

The interesting projects for students to explore with their certificate skills and their agile approaches that will get them heads turning in their direction:

data lakes, for the db cert folks
chatbots
blockchain

And be sure teams are, for their projects, leveraging Amazon's cloud infrastructure - also becoming a baseline.

Those are the kinds of things that will get internship and new-graduate attention, imo.

Hope that helps,
Ron

p.s. I'll forward to a few folks.

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