

Education Council Meeting
Grand Hyatt, Seattle WA
9/28/07

Meeting Notes

Participants:

Andrew McGettrick, Chair
Owen Astrachan
Joanne Atlee
Gordon Bailes
Michael Caspersen
Lillian (Boots) Cassel
Robb Cutler
Gordon Davies
Peter Denning
Sally Fincher
Dan Garcia
Elizabeth (Beth) Hawthorne
John Impagliazzo
Valerie Ishida (substituting for Maggie Johnson)
Lisa Kaczmarczyk
Deepak Kumar
Jim Kurose
Rich LeBlanc
Barry Lunt (substituting for Eydie Lawson)
Terry Linkletter
Ken Martin
Barbara Price
Eric Roberts
Carol Spradling
Heikki Topi
Joseph Urban (NSF CPATH Team, invited guest)
Alison Young

Regrets:

Jan Cuny (no longer on Ed Council)
Mark Guzdial
Maggie Johnson
Robert Jones
Eydie Lawson
Jane Prey
Kevin Scott
Janice Siplor
Larry Snyder

Eugene Spafford
Chris Stephenson
Joe Turner
Patrick Walsh
Jeannette Wing (no longer on Ed Council)

Introductory Remarks/Meeting Highlights:

Andrew welcomed the new Education Council Members - Peter Denning and Beth Hawthorne; Peter was Chair of both the Education and Publications Boards, as well as a Ed Board member. Beth is the new Chair of the ACM Two-Year College Committee having taken over from Bob Campbell. Peter and Owen [Astrachan](#) were congratulated on winning their CPATH Awards from NSF. Andrew indicated that both Peter and Owen would make presentations about their CPATH Awards. Prior to these presentations, Joseph Urban, NSF CISE/CCF, gave an overview of the CPATH Program.

As a departure from the usual meeting planning, Terry Linkletter had organized an Industry Panel with four panelists to discuss their: recruitment needs, problems with higher education, and observations. Ed Council Members introduced themselves and educators indicated how long they have been teaching; it looks like Peter remains the "Godfather" of the Council with 49 years of teaching.

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Andrew stated that we're still trying to find the best ways of dealing with this large group, making sure that members have assignments in order to give them a "buy-in" to the Council's modus operandi. It's important, Andrew stated, to use these meetings to keep the momentum going. Everyone needs to be involved and the Task Forces need to be working, deciding on outcomes and dates. The Ed Council Newsletter was designed by Andrew to help keep the momentum going for those times between face-to-face meetings and conference calls.

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Action Item: Terry [Linkletter](#), Lisa [Kaczmarczyk](#), and [Deepak Kumar](#) were tasked with writing up the Industry Panel: [producing a report with potential follow-up strategies](#).

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Overview of CPATH Program/Awards, Joe Urban:

Through the CISE Pathways to Revitalized Undergraduate Computing Education (CPATH) program, NSF's Directorate for Computer and Information Science and Engineering (CISE) is challenging its partners - colleges, universities, and other stakeholders committed to advancing the field of computing and its impact to transform undergraduate computing education on a national scale to meet the challenges and opportunities of a world where computing is essential to U.S. leadership and economic competitiveness across all sectors of society. NSF is concerned about the changing demographics, the integrated nature of the

computing field, the movement towards multi-disciplinary domains, sustained U.S. leadership, and improving the competencies of U.S. workers.

“The CPATH vision is of a U.S. workforce with the computing competencies and skills imperative to the nations’s health, security, and prosperity in the 21st century. This workforce includes a cadre of computing professionals prepared to contribute to sustained U.S. leadership in computing in a wide range of application domains and career fields, and a broader professional workforce with knowledge and understanding of critical computing concepts, methodologies and techniques.”

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Joe indicated that there were four four project types: Community Building Grants; Evaluation, Adoption, and Extension Grants; [Institutional] Transformation Grants; and CISE Distinguished Education Fellow Grants. These grants cover a broad breadth of the computing community, but are not targeted towards K-12. He indicated that strategies for transforming the undergraduate level are needed at regional and national levels, as well as across an institution. Most of grants were planning grants, interdisciplinary planning models, or new models to test. CPATH cast a broad net, leveraging the \$6-million for this program to fund 27 projects. The new evaluation process will consider 10 projects. Key issues include: demographics, multi-disciplinary approaches, integration, future challenges, competencies, leadership, and critical computing concepts, agile workforce. Fellows Grants were accomplished through self-nomination Transformation Projects are now underway and the key phrase here is “sustainable change.” Innovation could take place, Joe said, if you blurred the different areas/departments.

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Peter’s CPATH award was for his articulation of the “Great Principles.” Owen’s award was for a proposal on problem-based learning.

In terms of the “Community Building” awards, 19 projects were funded and focused on evaluation/adoption of innovative education, as well as institutional transformation. One of the projects was inspiring students through computing and the arts at UMass, Lowell with Chapman and Wake Forest. An award was given to Ohio State University for entrepreneurship and raising national consciousness about transforming undergraduate computing education; Computational Thinking to Purdue and NC State; Informatics and Computation to U. Illinois, Lafayette and Union Colleges.

What do we do to achieve national and regional outreach? What are the challenges we face? Dealing with K-12 issues and the community, working with professional societies, particularly with ABET, moving beyond curricular revisions, blurring transitional boundaries to make innovation take place, and establish sustainable change. Why CPATH is so important now is that Money Magazine rated “Software Engineering” the #1 career choice!

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We need to get the word out about CPATH; it's important to consider new opportunities for the upcoming solicitation in the spring - NSF might want to do a webcast about the Program, promote CPATH along with the [U.S.'s] American Competitiveness Initiative, etc.

Future CPATH opportunities involve other disciplines besides computing. It's important for those representing CPATH to talk with international agencies, industry, professional societies, in order to foster collaboration. Individuals interested in CPATH should review NSF 06-608, <http://www.nsf.gov/pubs/2006/nsf06608/nsf06608.htm> as background for the next solicitation. The first year [2007] concentrated on planning grants, and it is likely that 2008 will have that same concentration. NSF will be looking for proposals that include: cross-disciplinary models, and innovative action-oriented projects, with a goal of transformation. Transformation models are needed, not incremental change. The goal is to change the image of computing, and involve other disciplines. Broadening participation in computing is a different program.

Another NSF Project (not sure how this ties in with CPATH) is entitled "Software for Real-World System SRS)," and is concerned with embedded systems and mobility issues. For this \$10-million Program, NSF is interested in how, and if, SRS can be designed in new ways. For this challenge, we will need to identify new scientific principles, engineering processes, and educational pedagogies to produce fundamentals and key concepts. Proposals for SRS are due January 17, 2008.

The programs that are selected as award winners are expected to write up "highlights/nuggets" of their projects so that laymen can understand them.

Action Items:

1. Joe would like feedback from Council members on:
 - Ways to improve the 2008 CPATH solicitation document.
 - The CPATH project types - is this the right way to go?
 - Whether NSF should entertain nominations [not just "self-nomination"]?
 - Whether NSF should entertain Senior and Junior mentoring?
 - The Evaluation/Adoption phase.
 - How to increase the outreach of the CPATH solicitation?
 - Ways of promoting CPATH to colleagues.
 - Suggested CPATH foci for professional societies.

Great Principles of Computing, Peter Denning:

The title of Peter's proposal is "Revolution in Science/Resparking Innovation in Computing Education." The basic premise is that computing is a natural science. Peter's proposal calls for having three workshops and possibly a summit. There was a revolution in the 1940's in which computers were viewed

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as tools in science; the 1980's saw computation as a method of science; and in the 2000's, computation can be seen as a process of nature. A major sea change has happened! Computation is found naturally in science. Our tradition states that CS is the study of phenomena surrounding computers. Computing is actually the study of natural and artificial science. What are my objectives? To identify the deep structure of computing field, foster connects, create a common language for computing, as well as inspire young people, etc.

Comment [JI1]: What is this?

The following questions occur: What is information? What is computation? How does computation expand/limit what we know? In terms of the taxonomy of computing, there are seven principle categories -- 1) computation; 2) communication; 3) coordination with multiple entities; 4) recollection/storage; 5) automation/what can we automate? 6) evaluation/computing system deliverables; and 7) design; computing is also engineering. We have an opportunity to say computing is a science and part of engineering.

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According to Peter, the operating model for teaching CS has become obsolete! This model, Peter said, is NOT attracting students to the computing field. The current curriculum is from the 1960's and the principles of this model no longer fit. In this day and age, people like the "Starbucks" way of drinking coffee - having plenty of options. We need to work with new models, change our self-image.

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The outside world thinks that computing is just "programming" and "programming" is moving to India. The problem is, Peter said, that we believe we're programmers! We should be considered as scientists and engineers, experts on information processes, both natural and artificial.

The First Workshop would be on the Great Principles of Computing with about 30 people. In early 2009, the Second Workshop would be on Recognizing Innovators; I would bring innovators together with other innovators in order to initiate an innovation portal. The Third Workshop would be a Project-based workshop (late 2009), possibly at Neumont University, Salt Lake City UT. There would be a Final Report with recommendations for both ACM and the NSF. Computation is a revolution in science!

Interdisciplinary Problem-Based Learning, Owen Astrachan:

Owen's proposal is "Interdisciplinary Problems and Case-based CS." Educators, Owen said, are not making substantive changes. We're still doing the same stuff today that we've always done. If you were from 1984 and woke up amidst CS in 2007, things would be drastically different. Discussion about computing is at the wrong level. We should concentration on problems since they are the "basis for leveraging some changes at various granularities." "Integrated Learning" if learning for understanding rather than for recall of isolated facts. Owen produced a document to evangelize this PBL approach.

Owen's proposal demonstrated "Extreme PBL Internship." All his Advisory Board members are previous students of his that have gone on to do interesting things. His mantra is "First Duke then the world." We need learn from interdisciplinary problems. He cited the website TinyURL and was curious to know how their business model worked.

Industry Panel -- James Whittaker, Microsoft; Keoth Purser, Boeing; Demian Godon, Adobe; and Steve Yegge, Google:

Terry indicated that with industry's concerns about outsourcing, workforce issues, business acumen, knowledge of product/project lifecycles, etc., it was important for the Ed Council to bring representatives from industry together to discuss these issues. [The panel felt that most of what is currently being taught to CS majors is still important. The consensus felt that students could learn business skills on the job, as long they knew the technical skills. "Please continue to teach the hard stuff, we can teach the soft skills."](#) James Whittaker served as the Industry Chair.

Include Industry Report

Masters Initiative, Boots Cassel:

In addition to Boots, the following folks worked on this initiative: Michael Caspersen, Gordon Davies, Art Peyster, Kevin Scott, and Heikki Topi. Masters Programs exist in large numbers, but they vary greatly. There should be a wider dissemination of these programs. Boots indicated that we need a broader understanding of how work is around the world to better understand the reasons for these different programs. We need to develop a scheme for categorizing these programs [as they cover topics, such as: IS and Software Engineering](#). It would be worthwhile to document what schools are actually doing. At Stanford, for example, specialization is required in one of nine specializations. Berkeley has a five-year program.

[The students in these the programs have a variety of goals: to specialize in a particular field, to broaden their skill set, or to change careers.](#)

Action Item

[There is an older version of the Master of IS on the ACM website and it should be replaced with the most recent version \(2005\).](#)

We should also know how many Business Schools are actually integrated into any of these Masters Programs. It's important to know the trends influencing these programs.

Eric commented that it's best not to micro-manage Masters Programs; they're a cash cow for schools like Stanford [and very diverse. Stanford requires 45 credits and a specialization in topics, such as: AI, HCI, etc.](#) What's curious, he said, is that there aren't more Masters Programs. Andrew pointed out that according to the CRA Bulletin, graduate enrollment was up 11% in 2005.

ACM Role

It's very important to look at "best practices" outside the U.S. where there tends to be more of a mixture of different kinds of students - these programs have more of a professional rather than research orientation. The initial goal will be to document and categorize what is available, as well as determine who the key players are. Some of the steps will be:

- Document first using a global survey. Determine the mix of full time, and part-time students, and the percentage of returning mature students; professional and research-oriented.
- Identify the specialized degree information (gaming, forensics, etc.) and where the programs are located.
- Look at 5th year master programs.

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Technology & Tools Website Presentation, Dan Garcia:

Dan demonstrated the Technology & Tools Task Force's website created for educators to improve teaching methods. The website is divided into two sections: Tools for On-Stage use, i.e., while teaching, and Tools for Off-Stage use, those used for lesson creation, background material, research, etc.

It's important to have a "thumbs up/thumbs down" kind of approach for the tools listed on this site. Right now, the two sections each have a scroll bar.

What's important is that educators are asked for feedback on how they use specific tools in their teaching and/or research. This kind of annotation is tremendously helpful for educators [and others].

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Image of Computing Presentation, careersincomputing website, Heikki Topi:

Heikki indicated that Alan has done quite a lot of work on the computing careers website. We now have a webmaster, Clayton Smith, who works out of ACM headquarters. The site has been spruced up by the use of more visuals, eliminating a lot of content from the homepage, and including visually compelling features like the "Faces of Computing" contributed by Dan Garcia.

There is much more work to do on this website to make it a first-stop place for high school students, guidance counselors, and parents, to find it interesting and worth returning to on an ongoing basis.

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Reflections on Programming, Michael Caspersen:

Michael worked on programming education and he described his comprehensive literature search to document and explore potential successful approaches to teaching programming. Educators should pay more attention to skills rather than on programming. In the June 2007 of inroads he had written on What's the next steps? Two books - teachers' curriculum developer, a textbook for students that applies all these skills and not language-dependent. This is a methodology to use for doing other things than programming. "Process of learning." This is the "journey" and not the destination.

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Task Force Reports:

1. Image of Computing Task Force Report -

The Task Force realizes that we need more dynamic visual images on the careers website. And, we also needed to reduce the amount of text on the homepage significantly.

The new feature "Faces of Computing" is now a part of the careers website and we have added a number of other links, including cool computing news that Alan is freshening with new stories.

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While the careers in computing website isn't the flashiest site, it does provide important information. It might not transform someone's opinion, but it does inform.

A team of Barbara Price's students from Georgia Southern University evaluated the site and made recommendations. They will do a mock-up of a revised website that will be more visual!

Some of the ideas proposed by the Task Force include:

- Illustrate the top 10 reasons to major in computing with video clips.
- Identify schools that have profiles computing folks.
- Maintain a listing of computing departments and academic contacts.
- Steal/Borrow the profiles from BCS site.
- Use the characters from TV shows who are involved in computing.
- Link to important websites, e.g., Image of Computing website, NCWIT, etc.

The Task Force, Heikki said, is not exactly good at actually getting things done. We're better at coordinating or facilitating communications. For example, Alison Young showed our Careers in Computing DVD to the Task Force and everyone agreed that it was a very well done piece. It cost the equivalent of \$30,000 (USD). Task Force Members may want to consider developing a DVD along the same lines.

Task Force Follow-Up Actions:

- Let the Georgia Southern University's group of students apply the new design to the website
- Develop proposals to get funding for the next version of the website
- Find mechanisms for cooperation with well-funded efforts - NCWIT, etc.
- Explore ways to get students involved:
 - Student competition
 - HS students as judges
 - New graduates as role models
- Convert research results into practical recommendations

The brochure has generated several thousand hits per month, with the peak being last March. Additional coordination of the brochure and the website will be necessary. Heikki suggested that market research is needed to assess the actual impact of the brochure and website on students.

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- Heikki indicated that the Task Force could [and should] build upon the work done in this DVD.

What work needs to be done regarding the career website/brochure:

- We should determine the best ways to drive people to this website
- We should look towards coordinating or partnering with other groups/organizations since we don't have enough people power
- We should see if we can be involved with focus groups for 17-year olds, high school juniors and seniors

What would be ideal is to get funding for this website and have it designed in an optimal way that could have different sections appealing to high school students, guidance counselors, and parents.

Lillian suggested that the Task Force work with ACM Student Chapters to train representatives from these Chapters, using the brochure and website, to go into high schools talking about careers in computing. We could organize "x" workshops to get a cadre of trained students who would, after that, help to train others. The other idea involving Student Chapters that Lillian suggested was having a contest amongst the Student Chapters as to who could build the most creative and compelling careers in computing website.

John indicated that we should just go with funding professionals to make sure this website is actually done [redesigned]. John also said that we should consider redoing the careers brochures to make them as simple as possible to use - designed perhaps as fliers or bookmarks.

Deepak mentioned the book "Reconfiguring the Firewall," Burger/Creamer/Meszaros. In it, he said, are specific recommendations for

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improving the recruitment of women into the computing field. Many things are included in these recommendations: What should IT companies be doing? What should school counselors be doing? This book is filled with concrete projects, Deepak indicated that we could go back to CPATH with ideas for proposals, explore possible MTV connections, etc.

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In order for this Task Force to be effective, Heikki suggested that only one or two projects should be taken up actively.

Barbara's students from Georgia Southern University evaluated the careers website and made recommendations as to what would make it more compelling; they even indicated that they would do a mock-up with these design changes pro bono:

Insert Recommendations

Action Items:

1. Lillian to find out how many hits over the past year the careers website gets weekly, monthly, and whether a large distribution of brochures caused a big increase in web statistics.
2. Lillian to find out costs for reprinting careers brochure.
3. Lillian to find out about ACM's website limitations.
4. Jane Prey and Maggie Johnson should go to their respective companies to get funding for the re-do of the website once a proposal is drafted.
5. Try to determine the effectiveness of the brochure and website - put together anecdotal evidence, possibly conduct a survey.

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John mentioned that his Accreditation Task Force was given \$15,000 this fiscal year but he wasn't going to use it, and that this Task Force could use these funds. Deepak indicated that we needed a well-thought out proposal in order to make it possible to raise funds for the website.

Technology & Tools Task Force Report, Dan Garcia:

After giving a presentation of the Technology & Tools earlier and getting feedback from that session and then meeting with Task Force members, has contributed to a new vision of the website.

A light front end was decided upon. What's needed is to come up with a really clear vision of what's on the homepage in bold; hopefully these items won't change. The vision for this site might be illustrated using a video - it could really be an effective tool of how to use the site.

The site will be searchable, with good descriptive tags to guide users to course specific content.

ACM cannot be seen as endorsing any of these tools. What this site has to communicate are those features that are really helpful, and users must be able to search on anything, e.g., What have people done who have intersections with what I do, where I do it?

We can get potential help from Google, ACM, etc. We need to determine what links we are missing, new technologies, and then fold them into our new design. We're looking at a six-month schedule for deliverables: we intend to continue working on our look 'n feel for the pre-alpha draft. We want to submit a SIGCSE BOF to solicit more information, and then finally launch it to the SIGCSE community. It must be viewed as a transformative website with an active curator community and great resources. Maybe we'll even do a monthly podcast. What's important is that we want the computing community to feel a sense of ownership. Perhaps we might even solicit sponsorship from industry.

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Sally was supposed to document usage patterns of Nifty; she found that they have a moderator who filters stuff, a curator. Her research indicated that merely building repositories doesn't mean usage. Unless your tool is a really great plug-in, it will mean less adoption.

[What works: curators and rankings. Just building a repository won't guarantee its use; must reach out and involve the community. A SIGCSE BOF is one way to do this.](#)

Action Items

[The Task Force will consider adding IDEs, such as; Alice and Eclipse.](#)

[Web expertise will be needed from the Google and the ACM for the design and implementation of the back pages.](#)

[The site will be rolled out slowly with solicitations for community feedback and additions to assure buy-in and use. SIGCSE will be a soft launch.](#)

[Dan will submit a request for a BOF at SIGCSE.](#)

[Maggie will look at use and deployment of Google technology.](#)

[Alan will follow-up with ACM web staff.](#)

Curriculum Task Force Report, Andrew McGettrick:

Andrew indicated that the ontology project is much more difficult than previously thought. The link between ontology and curriculum development is very strong so it's important to keep the ontology project moving.

Barry is Chair of the writing committee for the IT volume - the committee consists of seven folks. In all, there are twenty-five individuals putting the IT volume together. They have received feedback from Education Council and Board. They have conference calls every Friday. We need to decide who will attend their next meeting.

Beth Hawthorne made a presentation on the work of the Two-Year College Committee, including work on their IT volume.

Larry is developing the process to have ongoing feedback on curriculum documents. So, if you've got these incremental developments, that's good but what about the full-blown redo? If there were a three-phase incremental approach, would that put us in the same place? The Software Engineering volume is being used as a pilot study for the Task Force.

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Heikki indicated that the IS community was working on their IS volume; they're testing some ideas to get more of the community involved. These are important experiences to share with the larger group. They are very conscious of the processes they need to use to pull folks in.

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Andrew indicated that the Task Force members need to:

- Find new ways of doing things
- Change the traditional image of computing and curriculum
- Understand why current teaching concerns are now too limiting

Brainstorming on the Future:

Globalization:

Andrew asked whether Council members thought globalization was an image issue? Carol said that according to some of the companies she talked with in the Midwest, they said that students need to be aware of cultural issues, e.g., working around the clock, etc. But how and when do you make students aware of these issues? Should we have projects with schools from other countries? Not everything is practical.

Study abroad programs are not necessarily done in computing programs but why not? To do so, would mean being able to cross credit students' courses. Perhaps we mean "international" issues and not "global". Initially there was an international Task Force created by the Ed Council - what happened? Alison volunteered to help ?

What we have done in Europe, Gordon said - getting educators there to talk with one another but having the ACM folks come over - worked, and that model could be replicated. Now a European conference has been organized that is supported by ACM. Now there's a model to learn from and apply to other countries.

John stated that the Council should have more representation from other countries so that Council members understand the educational needs worldwide. John said that Joe Turner sent information about a group of Koreans who are organizing an event on accreditation. ABET has shown interest in this and wants to be in a leadership position. IFIP has launched a

professionalism initiative with a computing certification. These are initiatives the Council should be part of and involved in. **Microsoft has signed off on it and the BCS may do as well?**

Computing for Other Disciplines:

John indicated that he and others from the Two-Year College Committee published an ACM report in 1993 on Computing for Other Disciplines. Though now outdated, the Ed Council could use that as a starting point. Eric pointed out that we need to understand our strategies.

Eric thought much more should be done for the K-12 arena. It's important to get the "ACM Educational Activities" spreadsheet completed so that Council members can see who, of ACM's subunits, are involved with educational activities for potential partnerships.

Action Item

Outreach to SIGS to coordinate and leverage educational activities and resources. Alan and Lillian will follow up with SIGGRAPH.

General:

Lisa commented that the Council needs strategies, things are dissipating. There's not a clear strategy; there are interesting things, but no clear objectives. Andrew said that the Ed Board should be the strategizing body and he would have to address that.

What's Next?

The next face-to-face meeting of the Education Council will probably take place sometime in April.

Thanks To:

Thanks to Joseph; Peter; Owen; the Task Force Chairs, Heikki, Dan, and Andrew; Valerie; Boots and Michael! Thank you for your presentations.

Thanks to Terry for organizing the Industry Panel!

Thanks to Andrew for putting the meeting together!

Summary of Action Items:

- Terry, Lisa, and Deepak were tasked with writing up the Industry Panel.
- Joe Urban would like feedback from Council members on:
 - Ways to improve the 2008 CPATH solicitation document.
 - The CPATH project types - is this the right way to go?
 - Whether NSF should entertain nominations [not just "self-nomination"]?
 - Whether NSF should entertain Senior and Junior mentoring?
 - The Evaluation/Adoption phase.
 - How to increase the outreach of the CPATH solicitation?
 - Ways of promoting CPATH to colleagues.

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- Suggested CPATH foci for professional societies.
- [Dan would like to have links to outstanding educational Tools and Technology for the website.](#)
- Lillian to find out how many hits the careers website gets weekly, monthly **over the past year**, and whether a large distribution of brochures causes a big increase in web statistics.
- Lillian to find out costs for reprinting careers brochure.
- Lillian to find out about ACM's website limitations and pass information to Image of Computing Task Force members.
- Heikki to select individuals to draft a proposal for the re-do of the careers website, [will considering recommendations from student team at Georgia Southern.](#)
- Lillian to try to determine the effectiveness of the brochure - put together anecdotal evidence
- Lillian to put together a listserv for the Communications Task Force (those interested in working on "ACM Educational Activities" spreadsheet. Go out to Ed Council to ask for those individuals interested in being on this Task Force.
- [Alan to continue coordination with NCWIT on robotics based outreach materials with Deepak.](#)
- [Alan to recruit ACM web staff to support the Tools and Technology website.](#)

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