

**Report of a Visit to Santiago Chile**  
**University of Chile**  
**Catholic University**  
**30 July – 6 August 2007**  
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This visit was for the purpose of sharing information on a variety of projects and activities related to computing education. In particular, my leadership of the Computing Ontology Project, membership on the ACM Education Board and its Curriculum Committee, and status as a commissioner of the ABET Computing Accreditation Commission were relevant to a number of initiatives active in the host institutions. This report will briefly summarize the information from those activities as it appeared to be of interest and of use to my hosts.

**Computing Ontology Project:** The goal of this project is to provide an objective and complete representation of the entirety of the computing related disciplines. There are several possible uses for such a resource that could be of value in Chile. In particular, the project will provide a complete listing of computing topics, including the relationships among those topics, that will be useful for the design of computing-related curricula. The ontology will allow any program to be displayed relative to other programs and to recommended or otherwise recognized standard programs with similar goals. This mapping will allow each program to see in what ways it is similar to others and where its uniqueness exists.

**Curriculum Committee of the ACM** As a member of the Curriculum Committee of the ACM Education Board, I was able to provide an update on the status of curriculum recommendations for undergraduate programs in computer science. In particular, the current recommendation, CC2001, is under review with an interim update expected soon after the end of 2007. Shortly after that, a full scale review and revision of the computer science recommendation will begin. The purpose of the interim review is to determine any areas of immediate concern so that emerging fields are more properly represented. These will be in the form of small modifications of the current report. The larger curriculum revision will be a much more ambitious effort. This project will begin an entirely new process of curriculum update development, with the computing ontology playing a significant role. More information on the status of revised curriculum development can be followed at the ACM Education Board website:  
[www.acm.org/education](http://www.acm.org/education).

**ABET Computing Accreditation Commission:** The criteria used in ABET accreditation have been changing since about 2000. The new approach is heavily dependent on program outcomes. The specific requirements of a computer science program are much less detailed than in previous years. The new approach calls for a program to understand its own objectives and the associated outcomes and to have mechanisms in place to assess progress toward achieving the stated goals. The proposed

criteria does have some outcomes that are considered basic to computing programs in general and a few additional ones that are specific to computer science. The most recent accreditation criteria, including the proposed changes that move toward a heavily outcomes based process, can be found at the ABET website: [www.abet.org](http://www.abet.org)

In addition to reporting on these specific activities, I was able to participate in discussions of questions of concern to computing educators in many countries. Specifically, we discussed the nature of teaching and learning activities and the serious issues of insufficient students choosing to study computer science and related fields. In particular, the difficulty of attracting women to the field was a topic of mutual interest.

On the subject of teaching and learning activities, we discussed the emergence of active learning and the notion that students learn through creating their own solutions to problems much more than by listening to lectures. This approach has shown results in terms of students really internalizing the lessons that they learn, but also leads to questions about whether as much material can be “covered.” The response is a question: Is it better to “cover” a lot of material and have students forget most of it at the end of the class or to design learning experiences that involve somewhat less material, but have that stay with the students much longer? Many people are choosing to have the students understand and remember more. The involvement of students in undergraduate research projects is one example of how students are getting involved in their own learning.

The problem of too few students has been a very serious concern for several years now. In the past year or so, a number of industry leaders including Bill Gates have spoken out about the reality of the computing workforce – that jobs are plentiful and that the industry needs well qualified computing professionals. There have been articles in the popular press about the career opportunities – including an article in CNN/Money Magazine in 2006 that reported that the “Best Job in America” is Software Engineer. The jobs were rated on categories such as salary and working conditions, but also on creativity. Software Engineering received an A in creativity, not a result that would be expected by many. This may be a significant factor in attracting women students and others who have been staying away from computing careers.

The ACM Education Board developed a brochure that has been widely distributed in the United States and has been copied and adopted in several other countries. The brochure provides information about the reality of the career options in computing and tries to dispel some of the myths that have grown up around this field. A related web site now exists on the ACM server, and a link appears at [www.acm.org/education](http://www.acm.org/education). Follow the link to the Careers Website.

Whether as a result of these activities or other factors, there is some indication that the problem with attracting students to computing is beginning to turn around. A number of institutions are reporting upturns in numbers of entering computer science students in Fall 2007. While the data is too new to predict a trend, there is at least some reason for hope.

Other issues related to attracting women to computing have also been studied. A

common result is the general unfriendliness of computer games and other environments that are the first exposure to computers for many students. The reputation of the field for demanding long hours and little social interaction may be another factor. Some companies are making concentrated efforts to address these issues.

This brief summary does not do justice to the richness of the interactions I experienced during my visit. I found the discussions interesting and thoughtful. Both students and faculty are clearly giving thought to issues related to the health of the computing discipline. I was happy to share the perspective I have from the variety of related activities in which I am engaged.

I most sincerely appreciate the opportunity to meet the individuals who shared their time and opinions with me and who were so hospitable and receptive to what I was able to bring.