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Contents

SIGCSE News in Brief

October brings both a change in season, as well as a change in leadership for the SIGCSE Bulletin. We welcome David Kauchak from Middlebury College, who joins Christine Alvarado as Bulletin co-editor. We also thank Z Sweedyk for her years of service to the Bulletin. Many exciting changes occurred under Z's leadership.

And speaking of exciting, in this issue we look at multiple collaborative efforts to broaden the reach of computer science education, including a new partnership between CS Principles, Exploring Computer Science and Code.org and a new (and easy!) way you can get involved in CS Ed Week this year.

We chat with Michael Caspersen in this issue's Member Spotlight. A dedicated member of SIGCSE, he's helped organized eight conferences! In addition, we have some information on other ways of participating with SIGCSE including special grants for CS education (p. 5) and a look at the Australasian Chapter (p. 6).

Finally, we recap the recent ICER conference held in warm, sunny San Diego, and we bring you a preview for next year's ICER in slightly cooler (but still beautiful!) Glasgow.

Newsletter Credits

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MEMBER SPOTLIGHT

In this feature of the Bulletin, we highlight recent accomplishments of our members. For this issue, Bulletin co-editor David Kauchak interviewed Michael Caspersen, Associate Professor and Directory of the Centre for Science Education at Aarhus University. Michael has research interests in computing education, programming didactics, programming methodology and object-oriented programming. He has chaired/co-chaired eight computer science education conferences and has published more than 50 paper on computer science education.

DK: How did you first become interested in computer science education research?

MC: Early in my career, I wrote an introductory programming textbook with two colleagues. The book was organized in the classical way where the structure was dictated by the programming language constructs (bottom-up progression). However, about a year after finishing the book, we developed fundamentally new ideas for a novel organization of the material. Instead of a focus on the programming language, we developed a focus on programming. A few simple and powerful ADTs (this was before OO) allowed us to focus early on essential programming techniques using only a very small subset of Pascal. Only later did we introduce (by need) various other aspects of the language (e.g. arrays, records, pointers, linked lists, files, etc.). We documented our efforts (in Danish); in doing so we read quite a few SIGCSE papers. Our efforts gave us a ticket to SIGCSE '95 in Nashville. That was a great experience and it became the beginning of a wonderful, rewarding, and meaningful journey in computing education research.

DK: What is your role as Director of the Centre for Science Education at Aarhus University?

MC: The purpose of our existence is to facilitate improvement of science education (or rather STEM education) at the secondary and tertiary level (high school and higher ed). For the secondary level, our scope is Denmark; for the tertiary level, our scope is the Faculty of Science and Technology at Aarhus University. I'm responsible for activities, people and finances, and I take part in the actual work at all levels. You can read more at our website: http://cse.au.dk/en/.

DK: What do you think is currently the biggest challenge for CS education?

MC: There are many challenges, but considering the global development on computing/informatics in school (secondary and primary), our by far biggest challenge is to identify what should be taught to all kids (not just those that want to specialise in our field), to develop appropriate teaching materials, and last but certainly not least to educate the teachers to implement the intentions. And education of teachers is not just about computing subjects; it is equally important to educate teachers in computing didactics, i.e. the pedagogical content knowledge (PCK) of computing education in school. The latter is what distinguishes computing teachers from, say, researchers and software developers.

DK: What is the most interesting CS education finding you've found recently?

MC: For many years, I had my focus on tertiary education and mostly, although not

exclusively, programming education. Realizing that we tend to teach 'program' as a noun rather than as a verb (with a focus on the programming language and finished example programs rather than techniques for program development), the most interesting finding was a framework to characterize the programming process and the formulation of a programming method for novices.

Recently, I have had the opportunity to work on the development of computing/informatics education in high school, including curriculum development, material development, and teacher training. The most interesting findings here [are] the emerging contours of a meaningful curriculum for all kids and an emerging framework for the pedagogical content knowledge appropriate for computing/informatics teachers.

DK: You have a lot of experience organizing CS education conferences. Do you have any advice or words of wisdom to others who might find themselves in similar situations?

MC: I have had the pleasure and privilege of chairing or co-chairing eight computing education conferences: ITiCSE 2002 and 2012, ICER 2008-11, WiPSCE 2013-14; three of them hosted here in Aarhus. Furthermore, I have been on the program committee of more than 30 computing education conferences.

It is important and (in periods) hard work, but it is also extremely rewarding. As chair you get the exclusive opportunity to read all submissions (including those that are not accepted), so you get a real feel for the scientific work in our community. And of course you get to engage in discussions with great colleagues about evaluation and selection of scientific work.

I have a few personal guidelines from which novice conference organizers can probably benefit:

1. Team up with someone who has done it (well) before and from whom you can learn.
2. Set up a proper organization with skilled and dedicated people with clear responsibilities.
3. Separate responsibility for content from responsibility for organizational stuff (to ease the burden and avoid conflict of interests).
4. Provide clear guidelines and deadlines for all (committee, authors, etc.).
5. Be inclusive but also ambitious and critical.
6. Be precise, appreciative, and constructive in all interactions.
7. Ask for help when needed (or better: before).

DK: If you had to describe your personality to people in one word, what would it be?

MC: Careful (meticulous and caring).

DK: What do you like to do for fun?

MC: I like to be (creative) with family and friends, enjoy music (listen and play), bike, and travel.

DK: Anything else you'd like to add?

MC: The most valuable thing to me, related to my work in computing education, is the wonderful community of bright, dedicated, inspiring, and kind people. I'd like to take this opportunity to salute all my dear friends and colleagues with whom I have worked and had interactions over the years. It's been a wonderful ride, and I hope it will continue for a long time to come.

A New Partnership to Reform HS Computer Science Education

By Owen Astrachan, Gail Chapman, Joanna Goode, Brook Osborne, and Pat Yongpradit

Changing the landscape of computer science education for both K-12 and higher education requires efforts by a large community working together to achieve education reform at scale. We are excited to announce that three groups—Code.org, Exploring Computer Science (ECS) and Computer Science Principles (CSP)—have formed a public/private partnership that will build on previous work of ECS and CSP.

Exploring Computer Science

ECS (http://www.exploringcs.org/) is an NSF-sponsored educational reform program built to address the historical lack of computer science curriculum, engaging pedagogy, and institutional support available for schools serving high numbers of students of color. ECS lessons promote an inquiry-based approach to teaching and learning foundational concepts in computer science, and the ECS program provides extensive and ongoing professional development support, which helps foster a teacher professional learning community.

ECS has seen marked success reaching a diverse student population during its five years in the LA Unified School District (LAUCD). Girls comprise 45% of ECS students. Since 2011, ECS has been implemented in multiple areas of the US, including the Chicago Public Schools, San Jose California area, Oregon, Utah, and DC Public Schools, with several other sites planned for the near future.

AP CS Principles

CSP (http://www.csprinciples.org/) is a new Advanced Placement course designed and constructed by a community of educators. Far more than a traditional introduction to programming, CSP is a rigorous, engaging, and approachable course designed so that each student will understand how fundamental computing concepts are transforming the world we live in, and how each student can use the concepts in their own lives and studies, and to participate in that transformation. This course is intended to broaden participation with the goal of a massive increase in both the number and diversity of students taking CS courses at many levels. Reaching this goal requires an expansion in the type, number, and reach of schools and teachers involved in teaching CS.

Owen Astrachan, co-PI of CSP, and Pat Yongpradit, Director of Education, Code.org. Photo by Joanna Goode.

Code.org

CSP and ECS are now being united within a high school course and professional development package offered to school districts nationwide by Code.org, a non-profit organization focused on bringing computer science to every K-12 school in the nation. As a public/private partnership supported by the likes of Microsoft, Google, Amazon and private donors from the tech community, Code.org has used its unique position to bring a coherent approach to scaling CS education by combining state-by-state advocacy, a public awareness campaign, and a comprehensive K-12 CS program that builds on the values of ECS and CSP: equity, inquiry, relevance, and quality CS pedagogy. As of spring 2014, Code.org will be working with 100 high schools in the first of a four-phase professional development experience.

The Hour of Code is Coming!

By Hadi Partovi, Code.org, and Mehran Sahami, Stanford University

This year brings a new way for Computer Science educators to get involved with Computer Science Education Week (CS Ed Week) activities. To celebrate CS Ed Week (Dec. 9-15), Code.org (partnering with Microsoft, Google, Apple, Bill Gates, Mark Zuckerberg, the Boys & Girls Clubs of America, and over 100 others) is organizing the largest initiative of its kind: a campaign to get 10 million students of all ages to try computer science for one hour. And you can help!

What is the Hour of Code?
It's a one-hour intro to CS—on a browser, smartphone, or unplugged. We're looking for educators from all disciplines to host it in classrooms. The online tutorials will require no prior experience.

Recruit Your Entire School to Participate.
If you're a K-12 educator, please recruit your principal and other teachers to get involved. If you're university faculty, please host an Hour of Code with your department for the entire campus. Have your students recruit others to take the Hour of Code throughout the week. Or ask your students to connect with local K-12 schools.

Prizes for EVERY Educator!
Every educator who registers to host an Hour of Code will get a gift of 10GB of free DropBox storage. And Code.org will donate a full class-set of laptops to one public, K-12 school in every state that hosts an Hour of Code for all its grades. Just register your school's participation (at: http://csedweek.org/participate) by Nov. 15 to qualify.
Please, help make a difference. This is our chance to make CS history! Sign up and learn more at: http://hourofcode.org

SIGCSE Special Project Grants

By Judy Sheard, SIGCSE Secretary, and Amber Settle, SIGCSE Treasurer

The SIGCSE Board would like to announce that applications for the next round of Special Project Grants are due on **November 15**. Special Project Grants of up to US$5000 are awarded each year to support projects that will bring some clear benefit to the computing education community in the form of new knowledge, developing or sharing of a resource, or good practice in learning, teaching, or assessment.

SIGCSE members interested in applying can get an indication of the range of possibilities for projects from the descriptions of projects that have been funded in previous rounds (see www.sigcse.org/programs/special/awards/) The Special Project Grants are competitive and only available to SIGCSE members.

For details of the Special Project Grants program see the Special Projects page on the SIGCSE site:
www.sigcse.org/programs/special/
Details of the application process are also available there:
www.sigcse.org/programs/special/apply/

The review process typically provides fast turnaround and applicants will be notified approximately a month after applications are due. Feedback will be given to unsuccessful applicants and they may be encouraged to re-submit in a future round.

Applications must be submitted online at http://www.jotform.us/tmbarnes/sigcse-special-projects.
Questions about the grant or application process are welcome and may be directed to the Special Projects review panel at: apply@sigcse.org.

The Australasian Chapter of SIGCSE

By Simon, Chair of the Australasian Chapter of SIGCSE

Australasia has a number of different meanings; but generally, and in the case of the SIGCSE chapter, it refers to Australia and New Zealand. The idea of ACM chapters seems to be to bring together members from a particular locality, so that they can take advantage of their geographical proximity to meet and discuss matters of common interest. In the case of a national chapter – or a bi-national chapter such as ours – this idea is not particularly practical, and the chapter has to work to define its purpose. Since its formation in 2007, the Australasian chapter of SIGCSE has been reasonably successful in doing this.

In 2001 Raymond Lister organized the first Sydney Regional Information Technology Education Conventicle [1], a 'clandestine' gathering for people in the region who wanted to discuss computing education research as if it were real research. Several years later there were conventicles running in three major Australian cities: Sydney, Melbourne, and Brisbane. After a few more years, however, cracks began to appear. The organizing principle of the conventicles was that at the end of each one, one of the people present would offer to host the next one. With this sort of minimal structure, if one person, for whatever reason, fails to host the promised event, nobody comes to it, so nobody offers to host the next one, and the series fails. The Melbourne conventicle has gone from strength to strength, but both the Sydney and Brisbane ones fell over.

Now, with financial assistance from the Australian Council of Deans of ICT [2], the chair of the Australasian chapter has taken an active oversight role. The Brisbane and Sydney conventicles have been re-established, and new conventicles have begun in Adelaide and Perth. Essentially, they are being held in every Australian city with enough universities to warrant the cross-fertilization that a conventicle brings. The chair now plans to vest this oversight in the chapter executive, who will always ensure that somebody is willing and able to host the next conventicle in each city.

In addition, the Australasian chapter has oversight over the annual Australasian Computing Education Conference, choosing the incoming chair each year, and offering its experience as a resource for the year's two chairs.

The chapter executive has also come to be recognized by the Australasian computing community as the authority on computing education. So, for example, CORE, the peak body for computing research and education in Australia [3], turns to the chapter executive to judge its annual teaching excellence award.

The chapter still has trouble meeting some of the expectations of an ACM chapter. When we receive an email telling us that an ACM Distinguished Speaker will be 'in the region', our possible response is tempered by the fact that the region is some 4000 x 4000km. But the chapter has succeeded in defining its own purpose, and is a strong and vibrant organization.

References:

[1] Lister, R (2004). A Clandestine Religious Meeting. *SIGCSE Bulletin* 36:4, 16-17.

[1] ACDICT 2013: The Australian Council of Deans of Information and Communications Technology. www.acdict.edu.au.

[2] CORE 2013: Computing Research and Education Association of Australasia. www.core.edu.au

ICER 2013 Conference Report

By Alison Clear, Quintin Cutts, and Beth Simon, ICER 2013 co-Chairs

This year ICER was held at the University of California, San Diego in its new 2.5 day format, running from the 12th to the 14th of August with the Doctoral Consortium held on the 11th. Paper submissions were a new record for ICER with 68 submissions. The Program Committee accepted 22 papers, 17 research papers and 5 discussion papers, a 31% acceptance rate. There were also 12 doctoral consortium presentations ably led by Jonas Boudstedt and Allison Elliot Tew and a series of lightning talks organized by Brian Dorn and chaired by Alison Clear. The keynote speaker for this conference was Scott Klemmer from UC San Diego, who spoke about "Design at Large" and how his work on design can be applied to CS education.

There were two awards given. The "John Henry" Paper Award recognizes the paper with the highest potential for future impact on the field. This year it was won by Michael Lee, Andrew Ko and Irwin Kwan for their paper titled "In-Game Assessments Increase Novice Programmers' Engagement and Level Completion Speed". The Chairs Award for Best Paper was won by Mark Guzdial, Georgia Institute of Technology, for his 10-year retrospective on the Media Computation program he initiated. Titled "Exploring Hypotheses about Media Computation", the judges were most impressed by the clear definition of research hypotheses early in the program's history.

ICER participants in discussion. Photo by Sarah Esper

A particular feature of the ICER conferences is the single-track nature of the conference and how every paper is discussed by all. With the conference room set out in cabaret style, each table discussed each paper for some minutes after its presentation and prior to questions being asked. Furthermore, participants could post questions and comments to a forum for each paper if there was not enough time to voice them during the session.

The ICER Banquet at Mission Trails Regional Park. Photo by Quintin Cutts

It wasn't all work – how could it be in San Diego? We took over the visitor center at the Mission Trails Regional Park for the conference dinner, and enjoyed fine wine, food and conversation in the fading evening light so particular to the San Diego area.

A very big thank you to all those who helped organize this conference, the local committee and helpers from UCSD, Simon for the wonderful job he does as submissions chair and Jan Erik Mostrom for handling the website.

A Look Ahead to ICER 2014

By Quintin Cutts, Brian Dorn, and Beth Simon, ICER 2014 co-Chairs

You are warmly invited to the University of Glasgow, Scotland, for ICER 2014 – the 10th conference in the series! The dates are August 11th-13th, with the doctoral consortium on the 10th.

This is going to be a particularly exciting year to visit Scotland – the place will be buzzing as it is the 700th anniversary of Scotland's famous victory over the English at Bannockburn. Furthermore, the date for a referendum to decide whether Scotland should split completely from the rest of the United Kingdom has been set for September 18th. For all you sport lovers, just before the conference, Glasgow is hosting the Commonwealth Games, a kind of mini-Olympics, with athletes from 53 nations competing. And throughout August, the Edinburgh Festival and the Festival Fringe, the largest arts festival in the world with nearly 3000 shows, will be running – and it's only a short train journey away.

The format of the conference will remain broadly the same. We are finalizing this just now, considering the inclusion of a poster track and a session to enable participants to get involved in research projects. The conference website will be up very shortly, and we look forward to receiving your submissions in due course.

Deadline SIGCSE

Here are some upcoming deadlines and dates you won't want to miss!

Oct 28	SIGCSE Birds of a Feather and Poster submissions: http://sigcse2014.sigcse.org/authors/
Nov 15	SIGCSE Special Projects Grants submissions: http://www.sigcse.org/programs/special/apply/
Jan 12	ITICSE Papers, panels and working groups deadline: http://iticse2014.it.uu.se/