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SIGCSE News in Brief

We want to start by thanking everyone who attended SIGCSE 2017 for making it such a marvelous conference. We hope everyone had safe travels back from Seattle and are already planning to join us at our upcoming ITiCSE, ICER, and Broadening Participation conferences.

In this issue, we had the pleasure of interviewing SIGCSE 2017 Award recipients, Gail Chapman and Mats Daniels. We thank them for the extended interviews and for their thoughts on the future of our community – be sure to check out the interviews below!

We also review the successful Koli Calling conference from last November and preview the upcoming ITiCSE 2017 and Broadening Participation conferences. Be sure to submit to ICER 2017, which has important April deadlines.

Finally, we hope you enjoy the articles on the SIGCSE project grants and project grant reports. Be sure to check out the article on benefits from becoming an ACM Senior Member.

We wish you all successful terms and we hope to see you in July!

Newsletter Credits

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ITiCSE 2017 Program

By Michael Goldweber, ITiCSE 2017 co-Chair

It seems that everything these days gets subjected to quantitative analysis: impact factors, citation counts, Researchgate statistics, Facebook friend counts, and conference prestige. Yes, even academic journals and conferences are all ranked; there are many bodies that rank computer science conferences and journals. One of the most well-known and frequently used is the "Australian" rankings. The Australian rankings are from Excellence in Research for Australia, which in turn gets its data from the Australian Computing Research and Education Association of Australasia (CORE), an association of university computer science departments in Australia and New Zealand.

CORE ranks each journal and conference on a five-tier scale: A* (4%), A (14%), B (26%), C (51%), and Other (5%); the associated percentages indicate the frequency that ranking is awarded. SIGCSE annually sponsors three conferences. Both ITiCSE and the Symposium currently hold the A ranking. This is very important because in Australia and other countries, scholarship that is presented and published in venues with a CORE ranking lower than an A, is rarely supported or recognized.

A key factor in a conference's ranking is its acceptance rate. From 2000 until 2009, the ITiCSE paper acceptance rate averaged around 33%. However, from 2010 through 2016 the average paper acceptance rate jumped to 41%. Acceptance rates are driven by the number of submissions and the number of papers selected to form the final program. In ITiCSE's early days, a program contained around 45 papers. From 2005 through 2011, this number jumped to the low 60s. In 2012, to lower

the acceptance rate, the accepted paper count was lowered to around 54.

As one can imagine, there is a delicate balancing act between having a full program, with as low an acceptance rate as possible, and also maximizing delegate participation. Furthermore, this must all be done while keeping a watchful eye on ITiCSE's CORE ranking, since the conference's ranking will undoubtedly be dropped down to a B if the acceptance rates are in the low 40's for too many years.

The above is all a preamble to our announcement of this year's ITiCSE statistics: 56 papers were accepted, yielding a 32% acceptance rate. It is not clear what is behind these excellent statistics: Bologna's well-deserved reputation as an ITiCSE host (just ask anyone who attended in 2006), pent up demand in Europe from ITiCSE's 2016 foray to Peru, Brexit uncertainly, or global climate change. Regardless, this is good news all around.

Hope to see you in Bologna!



Bologna, Italy
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Koli Calling International Computing Education Conference Review

By Judith Sheard, SIGCSE Vice Chair, and Calkin Suero Montero

Koli Calling International Conference on Computing Education Research is held toward the end of each year at Koli National Park in the centre of Finland. This cold time of year in Finland is well matched by a warm and inviting conference atmosphere. The conference is dedicated to scholarship of teaching and learning, and to education research in the computing disciplines. Koli is a single-track conference known for its inclusive spirit and lively discussions.

At the 16th Koli Calling we had a record number of submissions and attendance. The conference in 2016 was organised by the University of Eastern Finland in collaboration with Monash University, Australia.



Simon's presentation
Photo by Petri Ihantola

One highlight of Koli Calling 2016 was a keynote address by Professor Quintin Cutts from the University of Glasgow, Scotland, UK, titled "CS Education: Coming of Age and its Consequences". Quintin challenged our thinking about computing education, by questioning what we should

teach, how we should teach, and how we should train those who do the teaching.

There were a variety of interesting papers presented at Koli, but a few deserve special mention. The Best Paper award was a tie between two papers. "Threshold concepts in computing: past, present and future" by Kate Sanders and Robert McCartney, presents a thorough overview and analysis of research into threshold concepts, identifying some promising unexplored areas for future work. "The long quest for computational thinking" by Matti Tedre and Peter J. Denning, explores the theoretical foundations of computational thinking, explains its emergence, and examines the threats to computational thinking initiatives. Matti Tedre was also awarded the Best Presentation Award for his presentation of this paper. "Revisiting why students drop CS1" by Andrew Peterson, Michelle Craig, and Anya Tafliovich was awarded an Honorary Mention.

The conference program allowed time for a walk in the beautiful Koli National Park and traditional visits to the sauna and spa each evening.

Koli Calling is truly a special event. You are warmly invited to participate in Koli Calling 2017 in November.



Photo by Petri Ihantola

Project Grants

By Adrienne Decker, SIGCSE Treasurer

The SIGCSE Board is pleased to announce the recipients of the 2017 Travel Grant Program awards. The Travel Grant Program was created thanks to the generosity of Henry Walker, and provides faculty and teachers who have not previously attended the Symposium with up to \$500 in travel support to do so. This cycle, there were twenty-one applications and six awards were given.



Jennifer Reese
Photo by Sherry Dickens

Jennifer Reese is a computer science teacher at Seguin High School in Arlington, Texas. This is her first year teaching computer science classes exclusively and she is looking forward to networking with other CS teachers, as well as bringing new ideas into her classroom, particularly those about recruiting and retaining under-represented students for CS classes.



Anna Ritz
Photo by Anna Ritz

Anna Ritz is an Assistant Professor in Biology at Reed College. Being one of only a few computer scientists on campus and teaching computational biology courses, she is most interested in establishing connections within the computer science education community and furthering her work with undergraduates on a data-intensive research project.



Gina Sprint
Photo by Lyndsay Clarke

Gina Sprint is a Clinical Assistant Professor at Washington State University. Having just completed her PhD in May of 2016, she is very interested in learning about all the latest computer science education research, resources, practices, and about her colleagues.



Eliana Valenzuela-Andrade
Photo by Edwin Rios

Eliana Valenzuela-Andrade is an Associate Professor at the University of Puerto Rico at Arecibo (UPR-Arecibo). She is looking forward to participating in SIGCSE 2017 so

that she can bring back novel, interesting, and validated tools to her computer science program, as well as new opportunities for her students in Northern Puerto Rico.



Michael Zamansky
Photo by Michael Zamansky

Michael Zamansky is a Distinguished Lecturer at Hunter College. He has been heavily involved in K-12 initiatives, and his new role is developing K-12 teacher certification programs for pre-service and in-service teachers. He is looking forward to expanding his network of CS educators while at the symposium.



Evelyn Zayas
Photo by Evelyn Zayas

Evelyn Zayas is a computer science instructor at One Schoolhouse (oneschoolhouse.org). Actively involved in professional development at the K-12 level, she is participating in the *Technology We Can't Live Without* panel the symposium.

Congratulations to all the recipients! The next round of applications will be reviewed in fall 2017, so watch for more information about applications during the summer.

MEMBER SPOTLIGHT PART 1

In this feature of the Bulletin, we highlight members of the SIGCSE community. In this issue, Bulletin co-editor Leo Porter interviewed Gail Chapman, ECS Director of National Outreach and Co-author of Exploring Computer Science. Gail received the Award for Outstanding Contribution to Computer Science Education at SIGCSE 2017.



Gail Chapman
Photo by Shelly Hollis

LP: *I'd like to thank you for your significant contributions to the CSE community and to congratulate you again on earning the SIGCSE Award for Outstanding Contribution to Computer Science Education! Thank you for agreeing to talk with us today.*

LP: *You were previously the Director of Leadership and Professional Development at the Computer Science Teachers Association. Are you pleased with all the momentum behind K-12 teaching today? What do you think are our biggest challenges?*

GC: *So, I am very pleased with the momentum we have right now. We have hit a crossroad and there are tremendous opportunities happening right now. I think that the challenge is to not move too fast. We need to learn from things that have happened in the past. We have a history in*

CS education of following the jobs or following the enrollment in colleges, and we need to think about what we need to do systemically to keep this momentum going regardless of jobs or enrollment.

And because of that, I am worried that we will declare that we have finished before we have tackled what I consider the biggest issue, which is broadening participation. We can get enrollments up without really changing the overall demographic of who is taking computer science courses and who is succeeding in those courses. But I believe that all students should have the opportunity to participate in CS whether or not they are going on to major in CS or get a job in CS. Moving fast but learning slow is one of the biggest challenges we face.

LP: *Can you tell everyone a bit about your latest work with Exploring Computer Science (ECS)?*

GC: ECS is a program that started in LA unified school district and UCLA, and became a national program. One of the things that is most misunderstood is that ECS is not just about curriculum. The curriculum is like a musical score and if played poorly, won't work any better than any other program. The most important part of ECS is extensive Professional Development (PD) over an extended period of time. We work with districts and schools very closely to create systemic change so recruitment changes and teaching practices change. It is labor intensive, but if we think back to challenges, what we did in the past was to go at PD fast and furiously with a small group of teachers only to have those teachers leave the school - then what do you do? Our approach is much slower, but I think it has a greater chance of sustaining over time. And I am very heartened with

what I have seen with ECS expansion in terms of changing the demographic of students that are in classes and I hope that this continues as we grow into more schools nationally. This program has the infrastructure to go slow and make permanent change.

LP: *You mentioned that the curriculum is useful but that the PD is key. What is the biggest part of your PD?*

GC: We build our PD around three major strands: equity, inquiry, and CS concepts. Teachers plan lessons during PD and teach them to their peers. They then discover that folks interpret the lesson plan differently. This is part of being a teacher: you have to recognize that your students are all different. You then ask what assumptions you are making about those differences that might hurt students and then decide to do something about it—that's the equity piece. Inquiry focuses on students selecting their own contexts for projects so that they value solving the problem. Then teachers focus on students explaining the process over getting the right answer because the process is more transferable to a wider variety of problems. A lot of teachers we work with don't start with CS background, so we have to bring them along in CS. Then the teachers form learning communities with each other, some with more CS content knowledge and maybe others with more equity focus.

LP: *You taught mathematics and computer science in high school for 15 years. How has that experience shaped your interactions with the high school teachers in ECS?*

GC: It has been a long time since I was in the classroom, but 15 years is a long time to have been in the classroom. I have seen a lot of different administrations and many

'new' ideas that aren't always directly related to the teaching part. This helps me a lot when working with teachers. I also made a conscious decision to not get too far away from the classroom; staying a practitioner rather than going into research. I wanted to be not too far distanced from the teachers that I worked with. In this job, in particular, it is important that I have the background of working with districts, but also with teachers. Teachers need to be valued and their time respected but often, neither of these things happen. So, each year I try to visit classrooms to remind myself what folks are facing every day and to talk to teachers all of the time. When I facilitate PD, I like to work with a practicing teacher as a partner. I think I have been able to genuinely connect with teachers because I have maintained that empathy. I am constantly reminded of things that have happened in my teaching career. I think that helps.

I also know it is hard to change the way you teach. Seeing teachers making that kind of change is what really helps me keep doing this kind of work. Recently, I've been doing less PD than I have been previously, but doing at least some PD keeps me connected and constantly learning. I have a hard time understanding how you can work in education if you aren't constantly reflecting and growing in how you do things. Ultimately, it is all about what students are learning. So, I really try to learn from the teachers I work with and carry that into the different PD sessions.

For example, I just did a robotics PD a few weeks ago. I tried a lesson four different ways in the past four weeks and I am still not sure how I would do it in the classroom. This opened up a conversation with the teachers. The answer is I would probably do it differently depending on what

students I had in my classroom, but I don't get that opportunity. I have the opportunity to work with a lot of different teachers, so I get to change things with them but it's not the same.

***LP:** You talked about getting faculty change to occur. I imagine your background helps you establish rapport with the teachers. What else has been successful in making them change how they teach?*

GC: A lot of it is confidence. Being given permission to not do it right the first time. From a historical perspective, one of the things I worry about is that issue of moving fast, but learning slow. We know from research and people on ground about how adoption works. (a) The first time you teach something, it invariably doesn't go as well as you'd like. It takes three to four years for experienced teachers who know the content to feel comfortable with it, even if you're a longtime teacher with a variety of experiences. (b) We don't invest enough in PD over time for teachers and the support necessary to keep that going. Principals need to understand that the first year might not be the greatest thing in the world and they need to help teachers sift through a lack of confidence exhibited in many different ways (resistance, defensiveness; my way is better).

It is also important to get teachers to relax. Teachers who I have worked with for a year have learned this and there's a real benefit when we mix them with new people. The new people get the benefit of their wisdom and composure while the experienced people get to experience curriculum in a different way.

People sometimes don't get teaching. I've heard, "Why would you want to do the same thing over again?" You know, I've

taught the same content over and over again and the teaching experience is never the same.

There's this mindset of drive-by PD — do it once and it is done. I think this needs help. When teachers understand that I understand that drive-by PD is insufficient, that allows me to build a connection with them. Once that connection starts, change can happen and trust is built.

***LP:** You are working with teachers over an extended period of time. I think this makes your work incredibly special, but it also makes me worry about how we might scale changes and/or replicate you.*

GC: We have already been working on this issue within our PD model. One of my goals is to always have your students well-prepared to go out on their own. They will do things differently and probably better. Part of our professional development model is building my (and other experienced facilitators) replacements into the PD. Teachers first participate in our 2-year model of PD and those who show promise then participate in a facilitator development process. The key part to identifying those leaders is to find those who are really capable of both reflecting about their own teaching and those who can get other teachers to reflect about teaching. It is also imperative that they demonstrate a deep commitment to equity.

Our process takes at least a year, sometimes longer, because teaching is a learning process. Some participants get it faster than others, but ultimately they help facilitate with other mentors besides me. We have several of them now and so it replicates itself. We then begin having them co-facilitate and now many of our regions are completely self-sustaining and do all of their own PD. We bring everyone

together once a year to evaluate and discuss how things are going to build collective wisdom because (a) it is not a good idea for only one person to be doing these things and (b) the whole idea is to sustain a program locally. To do this, you need to let it go and be confident that what is happening is within the boundaries of what we expect in terms of fidelity of implementation. No one does it in exactly the same way, but they are philosophically aligned and use the same agenda.

***LP:** Thinking more broadly, what's your vision for CS Education as a field 10 or 20 years from now?*

GC: Oh goodness... I guess the same vision I had 5 years ago. Which is that I really would like to see CS as something that is taught in all K-12 schools in some way. Now, what that looks like is hard — I don't know what this looks like yet. I think that one of the mistakes that we make is that we often ignore that there are core principles in CS that have endured. In CS, the tools, languages, and designs change so fast that if we are trying to teach the popular tools today then we are always behind. We need to be focusing on the core problems—and then give students tools to imagine different things. In order for this to be effective, we need to build on the uniqueness of our very diverse country. Then give access to all students in a way that all their voices are valued.

CS education hasn't changed that much, unfortunately. If only students who programmed young or played with the machines when they were kids show up in our classes, then it becomes an echo chamber—as we always have the same type of student in the classroom. Then our thinking and our students' thinking just perpetuates itself and we end up with same view of the problem as when we started.

To make progress, we need to value everybody and not make assumptions about their suitability for computer science before we give them opportunities and support. And not make assumptions about who will or won't be successful.

I hope that the K-12 emphasis will change the image of CS as a way of ultimately changing universities. And then, maybe, colleges and universities will start thinking about it differently. Jobs won't be seen so much as the essential pipeline for CS students, but rather how important CS is for society. We know CS can change everything, and it has. But how do we capitalize on that while at the same time preparing for unexpected outcomes. One unexpected outcome has been jobs going away to automation. It is wrong to say that these jobs are coming back. That's not the right message. There is a lot of industry drive in CS education and that's self-serving and it should be, but Silicon Valley is not looking for the same demographic of people, despite what they might say, as someone in rural Iowa who is taking advantage of technology-focused tools to help his or her farming. How do we have them be valued and grow in a world where we won't be getting rid of the technology?

It is a complicated problem and I am not convinced that as a community we have landed on a message that works. CS shouldn't be a political football. This is good for kids, so schools should do it. And for whatever reason, we can't seem to consistently send that message.

Jan Cuny at NSF has tried to narrow the focus to equity-based programs. The funding has been centered on EECS and AP CS Principles and while it may be self-serving to say, that's a great thing. It's also important because I work with schools and they are constantly being bombarded with

the next new shiny thing. This isn't a strategy. Part of what educating a 21st Century Workforce needs to include is appropriate use of technology. There are children who think their phone solves problems, and it isn't ok that folks don't understand the conversation around personal email servers. If you make an informed decision to go in a particular direction based on understanding issues, then that is fine. But there have been uninformed decisions directly related to a minimal understanding of CS and this need to change.

***LP:** Broadening Participation in computer science faces a number of systemic challenges. What are the challenges in K-12 for broadening participation and what are some good techniques in trying to face them.*

GC: There is an assumption that if CS is required then all will be well. All I have to do is look at the history of math—that is required, and all is not well. Every student is enrolled in a math class at some point in high school. They are not all learning the same thing, some are being tracked out of courses based on their mathematical background. This is not broadening participation, this is putting bodies in seats. I feel like that is the focus right now in CS. Well, if we can put every student in front of a computer then we can say we solve the diversity problem. I want to know what happens to these students from elementary and middle school. Let's assume that they all take something because it is required. And we've got these fabulous numbers. Then they hit high school. For better or for worse, high school hasn't changed much (whole other interview) BUT high school has been about choice. It is also about sorting students. There is all of this inequity built up no matter what courses you have taken through your elementary

years and by the time you get to high school, at least how things work now, you are trapped by what math classes you had and your prior success/failure.

I would argue that no one knows anything much about the future of anyone in 8th grade, yet we make these decisions that have the potential to derail this person for life! Because if you don't take the right math class your freshman year, then everything on becomes tracked in a bad way for you. So, let's walk in and say CS is required in high schools. Chicago is working on it and they have infrastructure since they have been working on it for 5 years. Let's assume best case scenario. One thing going on is that some schools are better prepared than others to have this conversation. You first have to have the mindset that your students can all do it. And the instinct is to say "My students are not going to be successful in THIS kind of CS class, therefore we are going to offer this other less rigorous course" and then they can check this box on the requirement. This will track them. This will happen in disproportionately in low-income and minority schools since they often have the mindset that their students can't perform better. No evidence, per se, other than that is the way it has always been.

That's a gloomy picture and I don't mean to be gloomy. Folks want a simple solution to a complex problem. There is a lot of energy being invested into making it required, and make it count. Even though it seems to be a nice solution to solving the broadening participation issue, we still have the issue of what is being taught and who is learning. It also then raises issues with teacher certification. The first thing we need to do is recognize this is a complex problem and getting students into classes is a first step. Trickle down didn't work in economics and won't work here. Cutting

edge schools are getting better, troubled schools are getting worse. How do we stop doing the same thing over and over again? That is why I keep doing this work. I keep hoping that we will pass this initial patting ourselves on the back stuff (look at all these numbers and how exciting they are). I am not excited until I see where the numbers come from because success will be defined by us seeing growth in diversity of the student population in those numbers AND by seeing evidence of student learning and increased interest.

***LP:** How did you first get involved with the SIGCSE community? What made you want to join and caused you to stay with the community?*

GC: I knew that I had gone to SIGCSE for the first time in 1994. I was working at ETS and working with AP CS development committee. It turns out I was there because we had a panel to discuss the introduction of case studies in AP CS course. My reason for staying involved was two-fold. I had friends who were there and SIGCSE is all about the connections for me still and a lot of the AP CS readers were there. I also stayed because there were very few K-12 teachers who attended; there wasn't a lot of support for K-12 teachers and they didn't feel particularly welcome. I took that as a challenge and it has taken a while, but I feel really good about where things are now. Over the years we have had folks try different approaches, and this most recent CS10K to CSFORALL helped turn the corner.

Next we need to find ways to fund more K-12 teachers to attend SIGCSE because that has become kind of a privilege thing also. It's the same teachers who get to go all the time. It would be great to have scholarships or other ways to encourage and support K-12 teachers at SIGCSE.

LP: Where does CS research fit into your vision?

GC: It's important. The research needs to be targeted and I don't think it has been. I really appreciate the move in the recent NSF solicitation to Research Practice Partnerships. Now we are in this situation where there are a lot of implementations, but not a lot of research on what works because research and implementation have often been separated. I think combining these will be very helpful moving us forward. We're beginning to know what works and we need the data to back it up and I think that is what we need in both qualitative and quantitative forms. I am grateful that I work with a strong research connection on our project. Ultimately, we need better research AND we need the practitioners adopting effective practices. I think that is the key and this is where other disciplines have been ahead of us because they have already done much of this work. Ironically, there often isn't that much difference between CS and other STEM disciplines but our collective belief that we are somehow special has often gotten in our way of starting with what is known in STEM and building, rather than starting from scratch.

LP: What do you do when you aren't working?

The thing I most like to do is hide on my 30 foot sailboat and commune with the sea gulls and water and read good books. The boat is on Harbor Island. I actually lived in a 46 foot sailboat for 15 years. When I left that boat, I couldn't give up on that completely. It is my safe haven and I am ready for San Diego to get its good weather back. Two hours out there can give me perspective more than anything. I also like to walk anywhere and in general like to be outside.

MEMBER SPOTLIGHT PART 2



Mats Daniels
Photo by My Laurell

LP: I'd like to thank you for all your service to the CSE community and to congratulate you again on earning the SIGCSE Award for Lifetime Service to the Computer Science Education Community! Thank you for agreeing to this interview.

LP: You've made major service contributions throughout the SIGCSE Community, but you are probably best known for being Program Chair and Conference Chair of ITiCSE multiple times. Have you been happy with ITiCSE's progression as a conference for the past 20 years? Where would you like to see it be in 10 years?

MD: The ITiCSE conference is very special for me. I got involved already from the start in Barcelona, Spain 1996, as I was given the great opportunity of being conference chair with Boots Cassel for the second one to be held in Uppsala, Sweden 1997. Then I was program chair both in Dublin, Ireland in 1998 and in Krakow, Poland in 1999. I was thus quite involved in the early years of the ITiCSE conference and have now and then served in other positions at conference committees over the years before being conference chair again, together with Åsa Cajander, the conference was held in Uppsala 2014. The role as

future site coordinator that I've had since 2005, first together with Bruce Klein and then with Mikey Goldweber and Alison Clear, is perhaps the most fun assignment I've had in my career. Just imagine having the role of discussing with future conference chairs about their ambitions with holding the conference and sharing your ideas and experiences regarding the "spirit" of the conference, trying to ensure that the attendees of the next conference will get a valuable and enjoyable conference. This is indeed a rewarding and educational task.

With this background I have an excellent position to look back at the development of ITiCSE, especially since I've attended all but two. In a sense, I don't think they've changed much in that I find them to be friendly and energetic with a clear ITiCSE identity. I believe that the working groups have contributed significantly to this identity, since they are excellent arenas for building communities. These smaller communities then help for the general ITiCSE community. One change that I've noticed is the increased globalisation of the identity/community, which to me initially had a stronger US slant than it has today. That said, I think the globalisation still is heavily western oriented and I hope it will evolve to be even more inclusive over the next decade. I also think that the conference reflects the evolvment and maturity of the field of computer science education, as the papers and working group output show. Overall, I'm quite happy with ITiCSE as I think it has been an important contributor to the progress in computer science education and I feel confident that it will continue to play an active part in the future.

LP: *How did you first get involved with the SIGCSE community? What made you*

want to join and caused you to stay with the community?

MD: I've had a rather different path to my PhD, which I defended on April 9, 2011 exactly 30 years after enrolling as a PhD student at Uppsala University.

I started out as a traditional PhD student, although with a much higher teaching engagement than the norm at Uppsala today. I got a "mid-way" exam after a few years and started to teach full time. In my new role I also got involved in curriculum design and became frustrated with not knowing enough about what would be good for the students. This frustration led me to searching for sources to develop and especially communities to join, as I find interaction with people being a very important source for my own learning. An excellent place for this turned out to be the ACM Computer Science Education community, where I met interesting people and could engage in growing in my role as computer science educator. It is perhaps especially my involvement in the ITiCSE conference that has influence me the most, but even so I find the community important and well worth keeping in contact with. I think it is vital for progress to stay in contact with such communities.

A full description of my "journey" can be found in my thesis ([Developing and Assessing Professional Competencies: a Pipe Dream? Experiences from an Open-Ended Group Project Learning Environment](#))

LP: *Although we're talking about the service award, you've also been a highly successful CS Education Researcher. What do you think are our biggest challenges in CS Education Research today? What is your vision for CS Education Research 10 or 20 years from now?*

MD: My interest in CS education research stem from what I said earlier about being frustrated by now knowing enough. Anders Berglund and I started looking for places where they conducted research regarding CS education and the only place we found in the early 90's was the group around Nell Dale in University of Texas at Austin, USA. Vicki Almstrum was part of that group and came to stay with us for a year and was important in our efforts to learn more. I mention this as an example of the importance the SIGCSE community have had. Another is meeting Bruce Klein and Carl Erickson who became essential in getting the RUNESTONE project running. The RUNESTONE project was about creating an educational setting where students from Uppsala and Grand Valley State University in Grand Rapids, USA collaborated. This project led to CS education research PhD degrees for Mary Last at University of Texas at Austin, Martha House at Open University, Milton Keynes, UK, and Anders Berglund, Uppsala. This course setting is still used in Uppsala, where Arnold Pears, the leader of UpCERG (Uppsala Computing Education Research Group), just have included students from Hanoi in Vietnam in the current course offering.

To me it was important that our work towards creating an environment where CS education research was accepted and considered to fit within the technical and natural science faculty. I consider it important to be anchored in the subject to understand the value of the research, an aspect that is coined "The Uppsala Model" for doing subject didactic research at Uppsala University. To me the "home" of CS education research is one of the most challenging aspects of this type of research. That said, I also think there is a danger in expecting such research to be measured with respect to how it influences

the current practices and content of CS education. Challenges stemming from uncertainty where the discipline belong and how success and value should be measured are obstacles when it comes to finding (or creating) funding bodies and people able to evaluate quality of such research. I think we have come far in the slightly over two decades I've been in the area, but there is still much to be done. It is my hope that CS education researchers will have a clear home for their engagement ten years from now and I envision that Universities (and society) have recognised the value of such research and that there will be substantial funding to bid from.

***LP:** Part of your research has examined using Open-Ended Group Projects to teach professional competence. With burgeoning enrollments, what advice do you give to faculty on how to use these projects when teaching at scale?*

MD: First of all I want to point out that I'm convinced that learning environment based on Open-Ended Group Projects and open-ended problems in general are excellent for preparing students for their profession, but there are many challenges with this. I first started to write about Open-Ended Group Projects together with two colleagues from the UK, Kristine Faulkner and Ian Newman, in an attempt to deal with meeting opposition and suspicion with regard to using such educational settings. This work eventually resulted in my PhD thesis and many collaborations, e.g. with Tony Clear, Ville Isomöttönen, Brian von Kinsky, Marta Laurusdóttir, Cary Laxer, and Robert McDermott apart from those in UpCERG. This work has been about understanding various aspects of open-ended learning environments, e.g. motivation, learning, teaching methods, identity (students and

teachers), and quality assurance. The setting has apart from the RUNESTONE course been the IT in Society course, where students from Uppsala collaborate with students from Rose-Hulman Institute of Technology, Terre Haute, USA and Gannon University, Erie, USA in a semester long open-ended project with the Uppsala County Council and the Academic Hospital as clients.

Based on the research and experiences I want to highlight the following general issues when it comes to creating learning environments intended for development of competencies relevant for the future profession:

- 1) Make the pedagogical ideas behind the educational setting very explicit.
- 2) Make the learning goals clear.
- 3) Make the meaning/definition of professional competencies (transferable skills, general skills etc.) explicit.
- 4) Make the way you will evaluate the students explicit and understandable for them.
- 5) Make the problem to address complex enough to allow for many appropriate ways to approach it.

When it comes to scalability there are no easy solutions, neither using open-ended problems nor more traditional methods. Degree programs should be set up such that learning how to function in learning situations based on open-ended-ness should be done in a progressional manner, which would reduce the risk of students “falling out” due to pure confusion about what to do. Reading up on the literature and discussing with those that have used similar settings is important for realising, and hopefully avoiding, common pitfalls. It is essential that you as a teacher believe in the value of the setting and, not least, let the students know you do. I see open-

ended learning environments as being much more about the process than the product and I thus think that there should be ways to “observe” the behaviour of students. That said, I don’t think the motivation of creating something should be underestimated. Getting back to scalability, I suggest redistributing teacher (and TA) time towards observation and guidance from “pure grading” to deal with high numbers. Students should create their own portfolio rather than providing them with a sheet with a list of finely graded courses could be a setting where scaling up could be handled, especially in the case of courses based on open-ended setting.

LP: *For someone thinking of getting more involved in the SIGCSE community in service, what advice would you give them?*

MD: I would advise reflecting on which issues one finds essential to CS education and then read the literature and attend conferences. Work on identifying persons with similar interests and search them out, especially if the interest is about serving the community. There are many different roles to play, e.g. on conference committees, and make yourself known as having an interest to serve.

LP: *What do you do when you aren’t working?*

MD: I do believe it is important to be in good physical condition in order to function at home and work, and thus try to find time to exercise. I’ve had a bout with cancer and have as a goal to once again ski in Vasaloppet, a 90 km race from Sälen to my former hometown in Mora. Another interest, apart from family, is reading, mostly fantasy and popular science.

ACM Senior Membership Benefits

By Mark Allen Weiss, SIGCSE Board Member

ACM has three advanced member grades to recognize the professional accomplishments of its members: Senior Member, Distinguished Member, and Fellow. Among the 100,000+ ACM members, fewer than 4,000 members currently hold one of the advanced member grades. Many faculty who have been or are soon to be promoted in either a tenure or non-tenure stream are qualified for elevation to ACM Senior Member.

To be eligible for nomination, members must have 5 years of continuous professional ACM membership and at least 10 years of professional experience in the computing field. However, a Ph.D. counts as five years of professional experience, while a Master's degree counts as four, and a Bachelor's degree counts as three so in reality this is closer to five or six years of experience for many SIGCSE members.

Senior Members must demonstrate performance that sets them apart from their peers in one or more of "Technical leadership," "Technical contributions," or "Professional contributions." Again, most faculty will be able to meet this standard in at least one category, and probably all.

Technical leadership includes project leadership, research leadership, education leadership, management, etc. Are you an undergraduate program director, or a PI or co-PI on a grant, or have you developed courses or curriculum at your university?

Technical contributions include publications in refereed journals or conference proceedings, textbooks, work on standards, etc. If you are tenured, chances are you have published.

Professional contributions include service

to professional societies (SIGCSE!), review committees, conference committees, standards committees, etc. Have you refereed papers, or helped in conference organization in some capacity?

Applications are accepted every three months: March 3, June 3, September 3, and December 3. Senior members are self-nominating. The application form is simple, and you need three endorsers, which don't have to necessarily be ACM members. So, you can ask a colleague at your university. You can ask collaborators at other institutions. You can ask your chair or Dean. Don't be shy: this is part of their job description and a hallmark of successful administrators is their successful faculty. If you have recently undergone a promotion, chances are the endorsers have 90% of the endorsement written already.

Many of our colleagues (over 8%) in Electrical and Computer Engineering are IEEE Senior Members. It will be easier for your chair to compete for resources if she/he can demonstrate award-winning faculty. At least one service used by administrators to quantify faculty and department "productivity" considers the ACM Senior Member award in its metric. The effort involved in a Senior Member nomination is considerably less than preparing a paper or an NSF grant, and your chances of success are much higher. And after you are selected, no further effort (no annual reporting!) is needed. Standards for everything – tenure, promotion, awards – continue to rise; now is a good time to secure your Senior Member status and add that line to your vita and annual report.



SIGCSE Special Projects Grant Summaries

By Sue Fitzgerald, SIGCSE Secretary

Project Grants are awarded twice annually by SIGCSE, and we share project summaries from the projects awarded midyear. You can find information about upcoming project grants at <http://sigcse.org/sigcse/programs/special>.

Development of a Software Engineering Process Improvement Game

By Bruce Maxim, University of Michigan-Dearborn

The goal of this project was to create a computer game that emphasizes best practices in software engineering process improvement as students create virtual engineering artifacts during game play. Our digital card game rewards players for using good software project management strategies within the Scrum framework to complete projects on time and within budget, while meeting required software quality standards.

The design team created the user stories and a paper prototype for the Process Improvement Game (PIG) card game in February 2016. The development team created the game infrastructure using Unity3D and exported WebGL and Windows versions of the feasibility game prototype in May 2016. A first playable game prototype containing the tutorial level was completed during June 2016. This prototype was deployed on the web and was play tested by a small number of software engineering students during July 2016. The software engineering students were asked to complete an online usability questionnaire (Purdue 2016) and a short quiz on Scrum concepts after playing the game prototype.

Player feedback from this game play test was used to refine game play and create the two additional levels containing new virtual software projects. The development team created an online user manual to provide background information on Scrum for players without software engineering backgrounds. A complete game prototype containing all three projects was made available for public review on the GAME Lab web page in August 2016.

The final game was exported from Unity3d for three platforms (Android, Windows, and WebGL) in September 2016 and made available on the GAME lab website. During the Fall 2016 semester, several software engineering students played this final game. They provided feedback by completing an online quiz and an online usability questionnaire created by the development team. The students gave the game high marks on most usability questions. The students liked the interface aesthetics, card mechanics, game balance, and challenges posed by the game. However, the students gave slightly lower marks on the user guidance within the game. They indicated that some of explanations on the effects cards were not adequate and suggested that a pop up help window that repeated the initial card play rules would be desirable. The students were asked to complete a short true/false quiz on Scrum principles. It was satisfying to see that the players gave correct answers to the Scrum process and management questions. Their answers suggested that they recognized the importance of managing defects, budget, and time, as well as monitoring the velocity of code generation to provide effective project management.

The SIGCSE Special Project funds (\$3,200) awarded to this project were used to cover the salary of a part-time

Graduate Student Research Assistant (GSRA). The GSRA helped to create a paper prototype for PIG, supervised the undergraduate student game developers from our Senior Design course, and built a website to support game.

We are continuing to refine the usability issues uncovered by our assessment of the game and plan to submit a paper or poster to the 2018 SIGCSE Symposium in August 2017. We are making this WebGL game available as a free to play web game hosted on the GAME Lab website (<http://gamelab.cis.umd.umich.edu/PIG-Web/>). We are allowing all versions of these games (Windows, WebGL, and Android) to be free downloads from the same website.

Elegit Summary

By David Musicant, Carleton College

Many thanks to SIGCSE for the Special Projects Grant for our Git tool, Elegit. We used the funding from this grant to pay for a student to work during the summer of 2016 doing development on the tool and, as a result, we made significant progress. Elegit is now available at elegit.org for download and use by the community.

Here are some of the specific tasks we **accomplished this summer**.

New user interface. In the prototype that we showed off in our proposal, we had a user interface that focused on two source code trees: a local and a remote. Through user and developer testing this summer, we discovered (to our surprise!) that a single combined tree, annotated correctly, makes significantly more sense. We did significant redevelopment of the interface to represent this, while continuing to retain the idea that data flows between a local machine and a remote server. We believe

that Elegit is a much better tool as a result, and better helps students understand how Git actually works.

User study. We watched a number of students try out Elegit, and we learned about some aspects that work well in addition to others that need improvement.

Robustness. Before the summer of 2016, Elegit could best be described as a working prototype. It is now much more reliable and quite usable.

Speed. Some aspects of Elegit were painfully slow to use, and we did significant re-engineering to address this. It is notably faster in a number of ways.

Looking forward:

We are happy to report that our proposal to demonstrate Elegit was accepted as a demo for SIGCSE 2017, and we will be showing it off in Seattle.

We plan to continue working intensively on Elegit as there's still much to do. One set of features we mentioned in our proposal was tools to help instructors organize Git usage within a course. We're still very much committed to doing that, though that is still in the queue of things to come. We are also aware that we need to provide a set of tools to help people learn how to use Elegit, such as help screens, on-boarding, or other related structures. Those are up next in our continued development process.

Thanks again to SIGCSE for this funding. While we have much more work to do, this funding made all the difference for us to be able to deliver a usable product for the community in the time frame that we have.

CS for All, Equity, and Responsibility

by Tiffany Barnes, North Carolina State University

It's been one year since the White House's 2016 announcement about the CS for All, an initiative to provide access to computing education to all K-12 children. 2016 seemed to be a celebration marking a decade of effort by researchers and educators to broaden the participation in computing. Where are we now? We still have plenty to celebrate.

Thanks to support from Jan Cuny and the National Science Foundation, the leadership of Lien Diaz at the College Board, and the efforts of thousands of CS researchers, educators, teachers, counselors, schools, parents, and kids, we can celebrate the creation and successful launch of a new course that is designed to promote equity and broader interest in computer science. May 5, 2017 is the first Advanced Placement CS Principles exam, and we anticipate over 30,000 high school students will take it. This is an important step in the right direction – providing a computer science course that students in every state can someday access.

While we leverage the growing interest of “Generation CS” in computing courses and programs, we have an important charge: to expand access to computing education in a way that is equitable to all people. And, as educators, we have an even more important charge – to ensure that we integrate ethics and a sense of responsibility into the culture of CS. At a recent talk on “Science, Technology, and Human Values,” Anil Dash highlighted an issue that has appeared in the news many times over the past two years – that many people have left high-tech education and careers because of inhumane treatment and conditions. How did we get here, and how do we make a change?

We all know that, as a field, computing is changing ever more quickly and is having increasingly profound effects on society. However, with computing education available primarily through colleges and universities, we usually have only four years to prepare students for highly-skilled technical professions, and there is little time left to adequately address ethics. Instead of preparing computing professionals who reflect on the potential impacts of the technology we create, we focus on creating rigorous programs that challenge students to think quickly and solve complex problems. With high demand for our graduates, computing programs can select the best-prepared students, who tend to have high preparatory privilege. In this way, we are enabling the rich to get richer, and our graduates become the creators of technologies that all people use for their lives and work. Our graduates decide the algorithms that filter and control the content each person sees, and the way work gets done. Our graduates demand, or don't demand, equitable workplaces. Our graduates become the new leaders in tech.

We must change this by starting in our classrooms, where we can reflect on what impacts the technologies created by our students will have on people's lives, and where we can also create a culture of respect and a sense of responsibility to give back and be humane. Beyond that, we have a responsibility to find ways to help K-12 children learn computing, so that preparatory privilege doesn't determine who gets to create the technologies and algorithms that make decisions for us all. We also have a responsibility to help people learn how to talk about computing, so that they can speak out and demand that computing can—and does—live up to its potential to make people's lives better.

Deadline SIGCSE

Upcoming dates you won't want to miss!

Apr 7 Draft [ICER paper submission](#)
(Final paper due Apr 7)

Apr 14 Final [ICER paper submission](#)
(Drafts due Apr 7)

Apr 28 RESPECT 2017 paper, reports
and panel submissions due

May 19 [ICER 2017](#) Doctoral
consortium submission
deadline

Jun 9 [ICER 2017](#) paper notifications

June 16 [ICER 2017](#) Works in Progress,
Posters, and Lightning Talks
submission deadline

Jul 1-5 [ITICSE 2017](#),
Bologna, Italy

Aug 18-20 [ICER 2017](#),
Tacoma, Washington

Sept 1 SIGCSE 2018 papers, panels
and special sessions due
