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SIGCSE News in Brief

Greetings! Welcome to the October issue of the Bulletin.

This issue contains a description of the SIGCSE Special Projects grants that were awarded in May 2019 and a look into what the new SIGCSE Board, whose terms started in July 2019, will be focusing on in the next few months.

In our Member Spotlight we interviewed Dr. Amy J. Ko from the University of Washington. Amy has been researching the intersection between computing education, human-computer interaction, and software engineering.

Take a look at the Upcoming Dates and Deadlines section to see if there is a conference coming up you want to attend or where you can submit a paper. We hope you enjoy the *Bulletin*!

SIGCSE Board

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Upcoming Dates and Deadlines

Conference	Location	Dates	Full Paper Submission Deadline
Koli Calling 2019	Koli, Finland	November 21-24, 2019	already passed
SIGCSE 2020	Portland, Oregon, USA	March 11-14, 2020	already passed
ITiCSE 2020	Trondheim, Norway	June 17-19, 2020	not posted yet
ICER 2020	Dunedin, New Zealand	August 2020	not posted yet

Other conferences operate in cooperation with SIGCSE and are posted on the SIGCSE web site at https://sigcse.org/sigcse/events/incoop.html.

SIGCSE Board Initiatives
By Adrienne Decker, SIGCSE Board President

With every election of a new SIGCSE board comes the challenge of continuing the work of the previous board while looking ahead to see what new and interesting things are on the horizon for the incoming board members. The SIGCSE 2019-2022 board comes in on the heels of a highly productive 2016-2019 board that not only completed a lot of work, but also launched an entirely new SIGCSE-sponsored conference!

While considering the work of the next board, there are three main areas that rise to the forefront of work to be done:
- growth,
- partnerships, and
- branding.

For the organization, 2019 was a tremendous year, our flagship conference, the Technical Symposium on Computer Science Education celebrated its 50th anniversary with record attendance. We launched CompEd as a brand-new conference, ITiCSE 2019 broke all attendance records, and ICER 2019 was very close to breaking an all-time attendance record as well. Submissions for the 2020 Technical Symposium were once again up over the previous year (another record). As an organization, our conferences are clearly growing with the increased interest in computing education at all levels and around the world. As such, we are faced with the challenges of how to grow and still maintain the quality of experience our membership expects and appreciates from our conferences.

We also recognize the need for strategic partnerships during this phase of growth, we want to maintain our connections to CSTA and CRA-WP, and determine other effective partnerships to support our growing community. Within our own structure, we are seeing the SIGCSE Committee on Computing Education in Liberal Arts College creating a new charter and refocusing their initiative and we are looking forward to supporting their work.

Having celebrated some significant anniversaries in 2018 (the organization) and 2019 (the Technical Symposium), it is clear we have a past worth celebrating and information worth maintaining about our organization, but it is also clear that we need to ensure we are telling our story outwardly in a consistent and focused manner. As such, the organization

needs to make sure our brand is recognizable and that all the activities of the organization are well understood to be part of our community's umbrella. With a strong brand identity for the community, we can continue to leverage our past to bring about new and exciting things for the upcoming years in this time of exciting growth.

New Educators Wednesday Roundtable at SIGCSE 2020
By Zachary Dodds, Harvey Mudd College, Diane Horton, University of Toronto

A successful career as an educator involves more than a deep understanding of a research area. Even so, many new CS educators experience relatively little training as educators, and face more questions than answers, e.g., what career-paths do CS educators pursue? How do I choose a career path and institution that is right for me? How can I balance teaching, research, service, and a life beyond all those things? What are the balancing acts involved in working effectively with colleagues and managing the advancement and tenure process? What tips could help me organize a course, scaffold engaging experiences, and build lasting relationships with students?

The New Educators Wednesday Roundtable (NEWR) is a pre-symposium event at SIGCSE 2020 that, through presentations, discussions, and small-group community building, will tackle these questions. NEWR is designed to assist aspiring and early-career educators in exploring the non-research facets of an academic career. It will run on March 11, 2020 from 9am to 5pm and is open to graduate students and postdocs considering teaching-related careers, as well as pre-tenure faculty members and new teaching-track faculty seeking guidance and/or networking support. 2020's NEWR is one of several career-focused, SIGCSE-affiliated events that have served more than 200 educators over the past decade.

NEWR 2020 will feature alumni from past workshops, as well as early-career and veteran educators across many career paths and types of institutions. They will share their experiences and best practices on topics including:
- career planning and possible paths,
- job searches and interviews,
- classroom and teaching tips,
- scholarship and service,
- promotion and tenure,
- working with colleagues, and
- equitable practices in CS education.

Interspersed with the presentations will be several small-group discussions engaging participants with the questions and concerns most relevant to their situations. In addition, NEWR is a chance for community-building among the cohort, a group of like-minded and similarly-situated colleagues. Time is reserved for informal networking, and participants will be encouraged to meet and share experiences through the subsequent SIGCSE conference. Join us for the 2020 New Educators Wednesday Roundtable! More information and application instructions are at https://www.cs.hmc.edu/~zdodds/NEWR2020. The site also contains a tentative workshop schedule, links to prior workshops, and a repository of career-mentoring advice collected from past NEWRs.

We thank the SIGCSE Board for its generous support of 2020's NEWR, which is free for all participants. Some travel support is available, with preference given to graduate students. Seats are limited, so interested graduate students and pre-tenure faculty are encouraged to apply early. Workshop questions? Contact the organizers:

Zach Dodds (dodds@cs.hmc.edu)
Diane Horton (dianeh@cs.utoronto.edu).

SIGCSE Special Projects Grants Awards: May 2019 Round

By Judith Sheard, Former SIGCSE Special Projects Review Committee Member

Special Project Grants of up to US$5000 are available to SIGCSE members to support projects that will bring some clear benefit to the computing education community in the form of new knowledge, a resource, or good practice in learning, teaching, or assessment.

The SIGCSE Board is pleased to announce SIGCSE Special Projects grant awards from the May 2019 round. For this round a record breaking 39 applications were received. Four projects were chosen for funding plus one extra project under the special theme "SIGCSE: 50 Years and Beyond." This gave an overall acceptance rate of 13%. The following five projects have been funded:

Developing Physical Manipulatives and Games for Teaching Advanced Data Structures
Applicant: Mark Goadrich, Hendrix College, USA

This project will develop engaging card decks specifically for demonstrating advanced data structures. The card decks, together with games, exercises, and explanatory material will be made available to the computing education community.

Decoding Doctoral Student Departure: Faculty and Student Perspectives
Applicant: Kari George, UCLA, USA

This project will explore the experiences of computing graduate students with the aim of understanding why they would consider leaving and what would compel them to stay in their programs. The insights gained into student persistence will be valuable for educators who have the capacity to shape student experiences and outcomes.

Dive into Systems - A Free Online Textbook for Introductory Computer Systems Topics
Applicants: Tia Newall, Swarthmore College, USA, with Suzanne Matthews and Kevin C. Webb

The funding for this project will support the production of an online textbook for teaching introductory computer systems, architecture and parallel computing. The textbook will be freely available to the computing education community.

Developing Ethics Modules for Core CS and DS Courses
Applicant: Lori Carter, Point Loma Nazarene University, USA, with Catherine Crockett, Whitney Featherston, and Morgan Wheeler

The funding for this project will be used to support the development and trialing of a series of modules to teach ethics. The modules are designed to be suitable for integration into core computer science and data science courses.

For the special theme "SIGCSE: 50 Years and Beyond" A 50-year retrospective on academic integrity and computer ethics in CS Education
Applicant: Farah Tokmic, University of North Carolina at Charlotte, USA, with Mary Lou Maher

This project will investigate how academic integrity and the teaching of computer ethics has evolved within the SIGCSE community

over the past 50 years and recommend directions for future work. A time-series visualization will be developed to identify historical trends and patterns.

ICER 2019 Review
By Robert McCartney and Andrew Petersen, Conference Co-chairs

The 15th International Computing Education Research conference was held from 12-14 August 2019 in Toronto, Canada. We had 151 attendees (including 70 first-timers and 46 students) from 13 countries; this was the highest attendance for an ICER outside of the US. We had a record number of paper submissions (137), of which 28 were accepted, for an acceptance rate of 20%.

The heart of the conference was the presentations of the twenty-eight papers in a single-track format, with time allotted for discussion among the attendees, plus thoughtful questions and commentary. The papers covered a wide range of computing education research topics, from pedagogical content knowledge of teachers, to use of undergraduate teaching assistants, to use of theories in computing education research, to running a program for research by undergraduates. A common thread across the great majority of the papers was the use of empirical evidence to analyze research questions.

Three papers received awards. The Chairs' Award, given to the paper that "in the judgment of the organizing committee, best illustrates the highest standards of empirical computing education research" was presented to two papers: "Computing Education Theories: What Are They and How Are They Used?" by Lauri Malmi, Judy Sheard, Päivi Kinnunen, Simon, and Jane Sinclair; and "From Theory Bias to Theory Dialogue: Embracing Cognitive, Situated and Critical Framings of

Computational Thinking for K-12 CS" by Yasmin Kafai, Chris Proctor, and Debora Lui. The John Henry Award for the paper that, in the judgement of the conference participants, "attempts a task that may seem impossible and pushes 'the upper limits of our pedagogy'" was presented to Lauren Margulieux for "Spatial Encoding Strategy Theory: The Relationship between Spatial Skill and STEM Achievement."

In addition, there was a special session which named the best papers from the first five ICERs, chosen by a committee of past ICER chairs: Michael Caspersen, Alison Clear, Sally Fincher, Mark Guzdial, Anthony Robins, and Kate Sanders. As a follow-up, conference attendees were invited to propose the best paper for three years in the future and produce a poster for it. Examples are given in the pictures below.
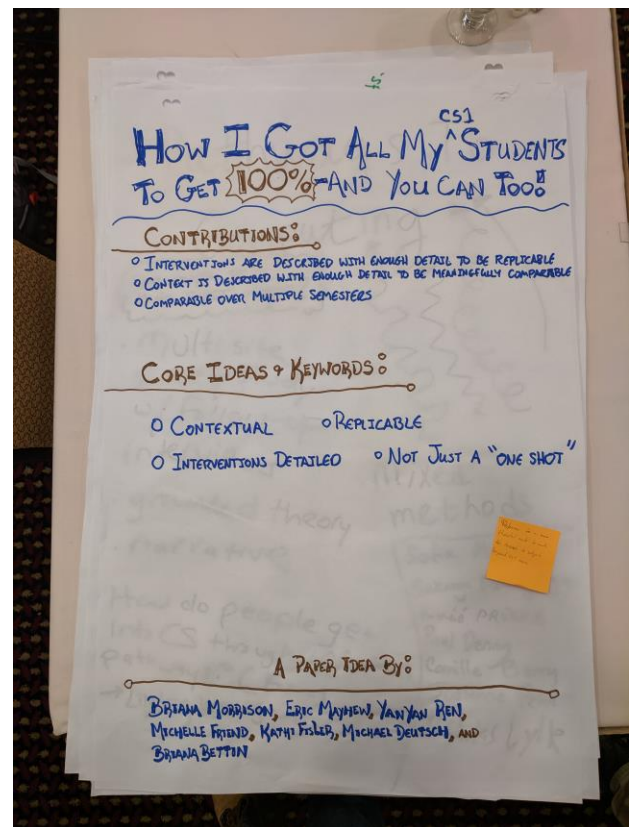

photo credit: Adon Moskal

There were two other presentation opportunities during the conference: nine Lightning Talks, where speakers had three minutes each to pitch new ideas, and a poster session with 16 participants, where people could present preliminary work and get feedback from interested listeners.
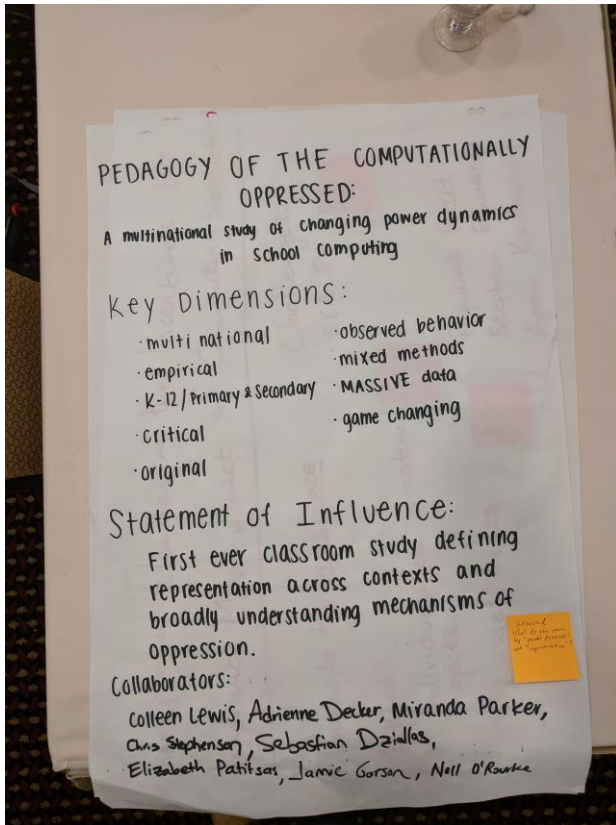
There were some other notable activities at ICER outside of the main conference. Three workshops were held the day before the conference: the Work in Progress workshop, organized by Mark Guzdial and Wil Doane, which provided the opportunity for ten researchers to present their ideas and get in-depth feedback from the leaders and other participants; "Student Learning: Creating, Refining, and Promoting Evaluation and Research Across Computing Education," organized by Adrienne Decker and Monica McGill; and "SPLICE: Computing Science Education Infrastructure: From Tools to Data"

organized by Peter Brusilovsky, Lauri Malmi, Steve Edwards, and Thomas Price.

Finally, ICER also hosted the SIGCSE-sponsored Doctoral Consortium for Ph.D. students. This year, Amy J. Ko and Katrina Falkner, assisted by mentors Elizabeth Patitsas, Colleen Lewis, Quintin Cutts, and Lauren Margulieux, convened the Consortium on the day before the conference. Nineteen students spent a day working with the mentors, and then presented their work at two dedicated poster sessions during the conference.

We would like to acknowledge the generous financial support of Google, our platinum sponsor, and the support and encouragement we received from the SIGCSE Board, particularly its chair Adrienne Decker, and our liaisons Briana Morrison and Leo Porter.

We look forward to ICER 2020 in Dunedin, New Zealand, in August next year!

Member Spotlight

In this feature of the Bulletin, we highlight members of the SIGCSE community. In this issue, *Bulletin* co-editor Jeffrey Miller interviewed Amy J. Ko.

Amy J. Ko is an Associate Professor at the University of Washington Information School and an Adjunct Associate Professor at the Paul G. Allen School of Computer Science and Engineering. She directs the Code & Cognition Lab, where she studies human aspects of programming. Her earliest work included techniques for automatically answering questions about program behavior to support debugging, program understanding, and reuse. Her later work studied interactions between developers and users, and techniques for web scale aggregation of user intent through help systems; she co-founded AnswerDash to commercialize these ideas. Her latest work investigates programming skills and new

methods for learning them, including programming language knowledge, APIs knowledge, and programming strategies. This work has spanned over 80 peer-reviewed publications, 11 receiving best paper awards and 3 receiving most influential paper awards. She received her Ph.D. at the Human-Computer Interaction Institute at Carnegie Mellon University in 2008, and degrees in Computer Science and Psychology with Honors from Oregon State University in 2002.

How did you first get involved with the CS education community?
For my whole career, I'd studied human aspects of programming from an HCI and Software Engineering perspective but had always done so with the goal of inventing interesting new tools to support programming. But learning was always in the back of my mind, though as a far more important thing: after all, tools are only useful if people know how to use them. When Jan Cuny and Jeff Forbes at NSF helped launch the Computing Education for the 21st Century program in 2010, it was the first time I saw a way to do funded research with doctoral students on CS education, and jumped right in. One of the amazing things Jan did with new grantees like me was invite us to an annual meeting to meet each other and the broader CS education community. I met so many incredible, passionate people, I was hooked! I pivoted fully to CS education research in 2015.

Could you describe some of the ways you've been involved in developing and enhancing computer science education?
Much of my role has been to investigate big questions about how we teach programming, and how people learn it. This includes research in programming language learning, how we measure what people know about programming languages, and how we design technologies to support learning about programming languages. While the community has long studied these things, I was excited to see what progress I could make by bringing perspectives and methods from HCI and Software Engineering. In addition to research, I've lately become interested in diversity, equity, and inclusion in CS education. I've been overseeing our undergraduate program in the UW iSchool, Informatics, and launched a large set of structural changes to diversity who we admit, to ensure we have a radically inclusive learning community, and to ensure our faculty feel prepared to be radically inclusive. I've also been working in Washington state, leading CS for All Washington, to try to bring CS education to all K-12 students in our state. Policy and advocacy are challenging but can be so impactful. I think more academics should use their platforms to make change, and more of our higher education leaders should reward this.

Can you explain how your work in computer education, human-computer interaction, and software engineering intersect?
When it comes to programming, there's really only one phenomenon at play in all three of those disciplines: a person trying to communicate to a computer what it should do in the future by writing a program. HCI is all about making sure that communication is productive, seamless, and empowering, by envisioning and evaluating new forms of communication. Software engineering is all about making sure that communication is successful, by exploring techniques for verifying what a person has told a computer is what they intended. Computing education is all about ensuring that the person doing the programming knows enough to successfully communicate. To have great software, we need all three of these fields.

Where do you think computer science education is heading in the next 10 years?
There's where it's currently headed and where I think it should head. Currently, I think too many computer science educators and CS education researchers focus only on

programming, myself included. If we continue doing this for another decade, we'll have ever deeper and more actionable insight into how to teach programming, but we'll be ignoring a lot of other really critical things about computing that students should know. For example, we should also be aggressively investigating how to teach students about the increasing role of data in computing via machine learning, the inherent ethical and value-based decisions underlying software design, and students' roles, as future software developers, in shaping our digital world. We're past the time where CS is just about making cool, powerful things. It's also about making good things, just things, meaningful things, and students in K-12 and college should know that.

What are the biggest challenges you see for computer science education today?
Today, it's clearly scale. There are so many people that want to learn what we have to teach, and there aren't nearly enough of us to teach them. There are even fewer of us that are really great at teaching. I've been working hard with the broader CS education community to envision new contexts where we prepare great CS teachers at scale, just as we prepare great math teachers and science teachers. It's time that we resourced Colleges of Education around the world to rigorously prepare the millions of inspiring and inclusive CS teachers we need to serve all primary, secondary, and post-secondary learners.

Do you think computer science should be added as a required literacy in all K12 and higher education?
That depends on what you mean by computer science. I love programming, I study programming, and I think a world in which everyone knew a bit about programming would be a really interesting one. But I don't actually think that world needs to exist. However, there are ideas in CS that I do think should be universal. For example, everyone should know, that computers are inherently

unintelligent. They get their intelligence from programmers, or in the case of machine learned programs, from vast encodings of patterns from the past, and that these two sources of intelligence are rife with bias, value judgements, and harmful social norms. I'd much rather live in a world in which everyone knew these facts and advocate for software that serves them, rather than one in which everyone knew how to program.

What do you enjoy doing when you are not working?
For most of my life, I've loved escape and food: I've reveled in the golden age of television, and love visiting new places all over the world to eat at amazing restaurants. But since I recently came out as trans and given myself a lot more space to be me and let others see me, I'm really just interested in finally giving myself all the things I avoided in the past: friendship, connection, and community. I think I'll spend a lot more of my time with people, changing the world, and celebrating its diversity.

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photo credit: Amy J. Ko