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SIGCSE News in Brief

Welcome to the July 2020 issue of the *Bulletin*.

In recognition of the pervasive, systemic racism and injustice brought to light repeatedly by the deaths of black individuals by persons who are meant to protect and serve, we would like to encourage you to read [Roxane Gay's op-ed in the New York Times](#) on May 31, 2020. Gay states that it is necessary for people to undertake “the difficult, self-reflective work of examining their own prejudices.” It will take conscious effort to do more than implicitly condone inequity through lack of action and thereby perpetuate the problems.

The first article is a call to action to increase the diversity and inclusion of computing education conferences, spaces, leadership, teaching, research, and technology by engaging the community more holistically with the formation of a **SIGCSE Committee** focused on issues of equity, diversity, and inclusion in computing education.

To initiate discussion in this issue of the *Bulletin*, we asked a few CS education researchers “what can we do as educators?” The responses are necessarily brief given our format, but are intended to spark discussion and action.

Other articles describe the upcoming ICER and Koli Calling virtual conferences as well as calls for papers for the SIGCSE Technical Symposium (TS) and a celebration of the 25th anniversary of ITiCSE in *Inroads*.

Our Member Spotlight features Dr. Manuel A. Pérez-Quñones. Dr. Pérez-Quñones is Professor of Software and Information Systems at the University of North Carolina at Charlotte (UNCC). His research interests include personal information management, human-computer

interaction, diversity in computing, and CS education. He has received numerous recognitions, including: Richard A. Tapia Achievement Award for Scientific Scholarship, Civic Science and Diversifying Computing (2017), CRA Nico A. Haberman award (2018), and ACM Distinguished Member (2019).

Based on Manuel’s and our shared interest in fiction and games, this issue of the *Bulletin* concludes with a recommendation for science fiction short stories that portray diversity. We would also like to recommend science fiction author John Scalzi’s 2012 blog post explaining privilege via a video game metaphor: “[Straight White Male: The Lowest Difficulty Setting There Is.](#)” We hope you enjoy the *Bulletin*.

Upcoming Dates and Deadlines

Conference	Location	Dates	Full Paper Submission Deadline
ICER 2020	Dunedin, New Zealand	August 10-12, 2020	Already passed
Koli Calling	virtual	November 19-22, 2020	August 24, 2020
SIGCSE TS 2021	Toronto, Ontario, Canada	March 17-21, 2021	August 28, 2020
ITiCSE 2021	Paderborn, Germany	June/July 2021	not posted yet
CompEd 2021	Hyderabad, India	December 2021	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 to Create Committee Addressing Equity, Diversity, and Inclusion in Computing Education

SIGCSE Board (2019-2022)

Recent events have been a painful acknowledgment that systemic racism and inequality are pervasive in society, with significant personal impact for members of the SIGCSE community. The SIGCSE Board has been encouraged by the call to action to increase the diversity and inclusion of computing education conferences, spaces, leadership, teaching, research, and technology. We would like to see the energy and momentum that has arisen in the past few weeks coalesce into structures that can enable significant and permanent change in our community.

As a board, we feel that this issue requires broad participation. We would like to engage the community more holistically by encouraging the formation of a **SIGCSE Committee** focused on issues of equity, diversity, and inclusion in computing education. The SIGCSE committee initiative, established in 2001, encourages SIGCSE members to participate in substantive discussions with the goals of investigating topics in depth and culminating with substantive reports. Our website has more information on the four current committees:

(<https://sigcse.org/sigcse/programs/committees/index.html>).

The SIGCSE Board would like to hear from people who would be interested in serving as chair or co-chair of a SIGCSE Committee addressing this topic. The chair(s) would then write a proposal and submit it to the SIGCSE Board. Instructions on the full process of forming such a committee are available on our website:

(<https://sigcse.org/sigcse/programs/committees/create.html>).

As a board, we look forward to working with the SIGCSE community and this new committee to create the changes needed to grow and improve our organization. We strive to be a more inclusive organization and serve as a model to other professional organizations on how to fight systemic racism and inequities in society.

ICER 2020 Virtual Conference

By Amy J. Ko, ICER Program Co-Chair

While many conferences this spring had to rapidly pivot to online, giving them little time to innovate, the ACM International Computing Education Research (ICER) conference announced 6 months before our conference. This was a blessing, in that we had the time to try to design an outstanding conference experience. But it was also a curse. Is an outstanding conference experience even possible? By August, will anyone want to be online at all? We set out to try to design a great experience, learning from every past online conference organizer we could find, and from our community.

We began by setting some principles to help focus our choices. First, we must make space for shared discourse above all else. Conversations about research, not presentations, are what drive progress. Second, we must build community. No academic discipline thrives on the relationships that already exist; conferences are a powerful social context to create new relationships that drive new collaborations and a sense of community. Finally, we must accept that we cannot plan how discourse is shared or community is built. Online conferences should be rich with serendipity, above all else.

We believe we have a conference design that will meet these principles. We will have a newcomer networking process that connects new attendees to regular attendees. We have chosen a platform, Discord, which allows for

attendees to more seamlessly move between video chat rooms without links, waiting rooms, or other friction, while also seeing who is in those rooms so that attendees can catch up with old friends, or introduce themselves to someone they've wanted to meet. While some presentations will be traditional single-track affairs, most will be parallel-track, with 25 minutes for questions and discussions in small groups, with the conversation archived for presenters and attendees to review later. And to prevent fatigue, the conference will be spread across four days (August 10-13 in North America and Europe), for 3.5 hours each day, at a time zone that is inclusive to nearly every continent between 7:00 am and midnight, except for Asia.

We hope these design choices preserve the very best parts of in-person conferences (aside from the best aspects of travel), while discarding with old conventions that needed improving anyway. We hope you'll join us at the conference to find out! Visit our new website at

<https://icer.acm.org>.

Early registration closes Sunday, July 19 New Zealand standard time



Photo credit: Andres Iga on Unsplash

Koli Calling 2020 Call for Participation

By Nick Falkner and Otto Seppälä, Koli Calling 2020 Co-chairs

We invite you to submit a paper or poster for the 20th Koli Calling International Conference on Computing Education Research (Koli Calling 2020) and join us ... not in Koli this year, but anywhere on Earth, 19-22 November 2020.

Koli Calling is one of the leading international conferences dedicated to the scholarship of teaching and learning and to education research in the computing disciplines. Koli Calling is a single-track conference for original and novel work with research, practice and systems presentations as well as a keynote and invited talks. The conference is known for its moderate size, intimate atmosphere, and lively discussions.

This year, due to travel restrictions around the world, the conference will feature an on-line academic presentation and discussion program, which local clusters of researchers around the world can participate in. While we cannot bring the Koli national park to your doorstep, we are strongly committed to maintaining the essence of Koli, facilitating online interaction, with many feedback opportunities.

Submitting to Koli will still mean full peer review, presentation at the Koli Conference, publication in the conference proceedings, and connections to the Koli community, but will not require you to travel at a time when international travel is both challenging and a little concerning. This will be an excellent, informative, and worthwhile online conference at a much lower price than usual. We hope this is an opportunity to bring together the community, meet new people, and have great discussions.

Topics of interest within the scope of computing education include, but are not limited to:

- Computing education research: theoretical aspects, methodologies and results;
- Development and use of technology to support education in computing and related sciences, e.g., tools for visualisation or concretisation;
- Teaching and assessment approaches, innovations and best practices;
- Distance, online, blended, and informal learning;
- Critical comparisons of remote learning and face-to-face;
- Learning analytics and educational data mining;
- Computing education in all educational levels, e.g., K12, context and teacher training.

SUBMISSION CATEGORIES

Research papers (up to 10 pages) present high-quality research, broadly categorised as empirical, theoretical or systems papers.

- Empirical *research papers* will include rigorous collection, analysis and interpretation of empirical data.
- Theoretical *research papers* focus on deriving a better understanding of the process of teaching/learning computing or of conducting research in computing education.
- System *papers* will present systems or tools developed as a contribution to research or practice in computing education, or perhaps to practice in education more broadly.

Short papers (up to 5 pages) focus on dissemination and discussion of new ideas in computing education practice or research that merit wider awareness and discussion within the community.

Poster/demo papers (2-page abstract) are interactive presentations of emerging ideas for research, teaching practice, or tools.

For more information see the conference website <https://www.kolicalling.fi/> or contact Nick Falkner and Otto Seppälä at kolicalling2020@easychair.org

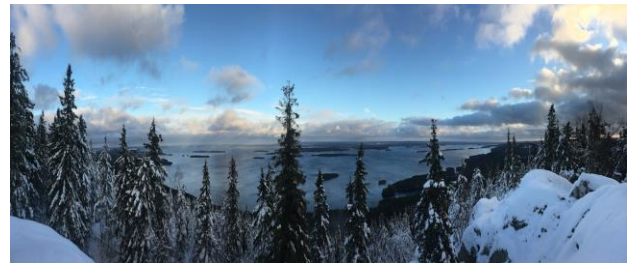


Photo credit: Nick Falkner

SIGCSE Technical Symposium 2021 Call for Papers

By Mark Sherriff and Larry Merkle, SIGCSE 2021 Symposium Co-Chairs; Pam Cutter, Alvaro Monge, and Judy Sheard, SIGCSE 2021 Program Co-Chairs

The SIGCSE 2021 leadership team wants to express support for the movement in the United States and around the world decrying racial inequality. The protests and conversations calling for reform reinforce the need for dramatic change in society.

We also want to acknowledge the conversation within our own SIGCSE community regarding underrepresented minorities in our computing classrooms and in our profession. The injustices students and faculty face from implicit bias and stereotype threat emphasize that we as educators need to do more to recognize these biases and fight against them as best we can.

We hear the call for justice and recognize that the Technical Symposium has an important role in this regard in our community. For several years now, the various symposium and program chairs have continued a tradition of inviting a diverse set of keynote speakers. Most recently for SIGCSE 2020, the chairs created the Affinity Group lunch series, in which members from and allies of marginalized groups in computing (African-American, Latinx, LGBTQ, Women, etc.) were to gather within the safe space of their

own affinity groups and provide feedback to the Technical Symposium leadership and members of the SIGCSE board on issues important to their communities. These efforts were obviously upended when the symposium was cancelled, but the 2021 team wants to continue and improve on this work next year. We sincerely want the community's aid in helping the Technical Symposium to be more inclusive.

The theme that the chairs have chosen for SIGCSE 2021 is "Expanding Opportunities." In light of current events, it seems that our call for finding ways to expand computing education to all has found even more meaning - one that we hope you will consider when submitting to the symposium. The chairs are working on more ways to showcase work in justice, equity, diversity, and inclusion throughout the 2021 program.

We also want to ensure that everyone can participate in the 2021 Technical Symposium regardless of pandemic-related travel policies. Therefore, the requirement to present in-person to be included in the proceedings will be relaxed for this year. More specifics on how this applies to each track will be posted on the symposium website when plans have been finalized.

We look forward to your submissions to the Technical Symposium and your assistance in reviewing them! If you are interested in reviewing or serving as an Associate Program Chair, please sign up at <http://sigcse2021.org/review>.

Please keep in mind the due dates for the various tracks:

- Friday, August 21, 2020: Paper Abstracts, Pre-symposium, Affiliated Events
- Friday, August 28, 2020: Full Papers, Panels, Special Sessions, Workshops

- Friday, October 23, 2020: ACM SRC, BoFs, Demos, Lightning Talks, Nifty Assignments, Posters

We plan to make a final decision in the next couple of months about whether there will be any physical presence in Toronto. In the meantime, keep an eye on

<http://sigcse2021.sigcse.org>

for the latest news about the Technical Symposium.

Celebrating 25 ITiCSE Conferences: Involving Everyone to Look at the Past to Construct the Future

**By Lillian (Boots) Cassel, Judith Gal-Ezer, and
Francesco Maiorana**

In December 2019, a group of volunteers started virtual meetings to discuss how to celebrate the 25th ITiCSE anniversary. Many initiatives were proposed and put forward but due to the pandemic situation and the possibility that the conference could be cancelled, a decision has been taken to postpone the celebration to 2021. However, the willingness to hold the conference was stronger than the crisis and the 25th conference took place in a virtual setting. As stated by the next organizer in the closing events, the "bar was set high" this year and the organizers were clever in turning a crisis into an advantage. The decision gave many the possibility to participate and to enjoy the conference in the virtual setting.

The experience opens the door to exploring new organizational avenues for future SIGCSE conferences. The 25th celebration of the conference will take place at ITiCSE 2021 in Paderborn. The ITiCSE 25th anniversary committee will have ample time to deploy the proposed activities and to put forward new ones with the help of new volunteers for which an open call will be launched this September.

The ACM *Inroads* call for contributions is one of the initiatives the committee has already put forward. The aim of the call is twofold: on one hand to celebrate the 25th anniversary of ITiCSE, and on the other hand to build a bridge between what has been done and what will be done. The call aims at giving a voice to teachers, educators, and researchers.

We welcome contributions spanning:

- history shared by the people who planned, organized, and participated in the 25 editions of the conference,
- learning resources, teaching practices, and technologies covering all aspects of the Technological Pedagogical Content Knowledge Framework, and
- methods to convey trends over the years arising from data demonstrating the evolution and uniqueness of the ITiCSE conference.

The ACM *Inroads* editors and the guest editors are making every effort to spread the call starting from all the communication channels of the ACM SIGCSE: besides the ACM *Inroads*, the SIGCSE members listserv, and this *Bulletin*. The initiatives obtained the support of other associations starting from the Association for Teacher Education in Europe (ATEE) and teachers' Communities of Practices (CoP) like Computing At School and Scientix, with the goal of an even closer collaboration with teachers. Other collaborations have been and are currently sought with research associations in Europe, America, and all over the world. **The guest editors welcome discussion with and feedback from all educators around the world.** Please share this with teachers, educators, researchers, and colleagues.

In summary, the ITiCSE 25th anniversary committee welcomes your input and your submission in response to the ACM *Inroads* call for contribution available at:

<https://dl.acm.org/action/showBmPdf?doi=10.1145%2F3399722>

The guest editors also welcome feedback by email to:

- Lillian (Boots) Cassel, cassel@acm.org
- Judith Gal-Ezer, galezer@openu.ac.il
- Francesco Maiorana, f.maiorana@campus.uniurb.it

As a CS Educator, How Do You Think We Can Address Inequity Issues That Exist in the Field?

By Jeffrey Miller and Karen C. Davis, SIGCSE *Bulletin* Co-editors, Brandeis Marshall, Nicki Washington, Manuel A. Pérez-Quñones, Leo Porter, Juan E. Gilbert

We asked several CS education researchers to offer brief remarks (about 200 words) to spark discussion and provide ideas for actions we can all take to address inequity issues. Five responses are included below.

Brandeis Marshall, Spelman College:

Consider using part of your class time to intentionally share and normalize the contributions of BIPOCs in computing. For example, I created the [BlackComputing series](#) in my Fall 2014 data structures course since learners were unfamiliar with Dr. Grace Murray Hopper's work or knew the work of computer scientists who identify as Black. A mixture of Black men and women of varying ages from public and private sector were featured.

Scroll through the [#BlackComputing hashtag on Twitter](#) for interesting facts. Learn and teach about the work of Dr. Gladys West, the West Area Computers, John Henry Thompson, Dr. Mark Dean, Roy L. Clay, Sr., Dr. LaTanya Sweeney, Marie Van Brittan Brown and so many more. And you can also head over to [Represent365](#).

As an academic community, conversations need to shift from talk to action in the higher education faculty, staff, and administration ranks. You can read, share and cite the work

BIPOC scholars in your departments and research subfields. You can then accomplish meaningful research PI/coPI partnership with BIPOC scholars (not simply senior personnel or collaboration support roles).

A [website resource](#) has been developed through a collaboration of ShutDownSTEM, [Particles for Justice](#), and [VanguardSTEM](#). It provides sharable calls to action and prompts to develop your plan to help eradicate anti-Black racism.

Note: this is only a start.

Nicki Washington, Duke University:

I think the biggest thing to do to address the issue is for people to stop assuming they know the solution and start listening and learning, specifically from social scientists. There is this attitude in the field that if it isn't quantitative, then it isn't “acceptable.” There is so much qualitative research that has specifically called out the issues that we continue to claim there are no solutions for. Yet, it's been consistently ignored for “numbers,” specifically, measurements that mean nothing (e.g., total number of students from a specific identity in the major, total number of students of that same identity who earned degrees, etc.)

There's been no focus on the “why?” Why are you not retaining students? Why are students (and/or faculty) not being recruited or retained? It's bigger than the issues of having representation of one's self in the field. This is important. However, it doesn't speak to the blatant racism and/or bias that students experience in classrooms, office hours, and informal learning environments that impact their desire to remain in the field. Studying social science research means that faculty have to acknowledge and accept that it's not just students' sense of belonging; it's a sense of belonging that faculty have contributed to in terms of problematic environments. There are many who aren't willing to acknowledge that

they've caused more harm than help to some students.

There's also the issue of people attempting to now rush to create a solution to “help” when they still haven't done the work themselves to understand identity and how race, gender, class, ability, sexual orientation, and the intersection of these identities can impact students in varying ways. People think it's simply just having discussions now about these identities in course content. That again can lead to more traumatic experiences, bias, and racism, because computing faculty aren't taking the time to do the work to understand why these issues are present and how they may have contributed to them.

Instead of rushing in the fall to ensure that you prove to students why Black Lives Matter to you, it's more important for faculty, administrators, and anyone in computing education take the time to become actual students of social science. Read, digest, self-reflect, assess, check your own privileges/biases, and THEN identify how you can implement these changes in your courses.

Finally, consult experts: social scientists and other computing faculty who've been doing this work. Some of the most important people are those faculty from systemically marginalized groups who have been doing the work since the moment they wrote their first “Hello World.” However, their work was always minimized and overlooked as “diversity work” and not “research.” Well, here we are in a situation where the same people who were minimized and overlooked are the only experts in computing who can speak to this. However, if they are consulted, then ensure they are appropriately cited/compensated. The past few months have already been overwhelming, exhausting, and triggering. Co-opting their work would be adding insult to injury.

Read about [teaching cultural competence in my work here](#).

Manuel A. Pérez-Quinones, University of North Carolina at Charlotte (excerpted from a *Medium* blog: [What Can CS Departments Do?](#))

Clearly society has largely ignored the systemic racism that has existed for years, so much so that public protests erupted in almost coordinated fashion across the globe. It is hard to tell you how to dismantle all of these deeply rooted causes of why we are where we are in a short writeup.

It should come as no surprise that many things we assume to be fair, standard, or just plain normal in reality are not. Even our notion of “fair” has been constructed from a point of view that prioritizes fairness for certain groups. Not only is history written by the victors; laws, structures, and other pieces of society are developed by them too. To expect them to be fair or equitable is naive at best.

If I had to summarize my recommendation in one marketing-ready, jingle-appropriate statement, it would be: **rethink all of your assumptions**. Let me give just one example for now: starting a student chapter of a professional organization. Most student governing boards have some language like this: student organizations must be started by students and led by students. In theory, that sounds beautiful and magnificently empowering.

The problem is often that the communities that have been marginalized, ignored, and discriminated against are not empowered to take that step. While allowing students to self-organize seems like an equitable idea, because of societal pressures, underrepresented students might not take advantage of these. Help them explore these opportunities, explain to them what a student organization is, mentor them on the value of having/running such a group, teach them about creating a legacy that might impact students down the road. Then step aside and let them run it.

Leo Porter, University of California San Diego: How You Teach Impacts Who Succeeds and Fails

One tangible thing that we can all do to address inequity issues in CS is to recognize that our decisions about *how we teach impacts who gets to succeed in computing*. We know from a meta-analysis on the impact of active learning in STEM classrooms that using active learning narrows the achievement gap for students from underrepresented groups ([Theobald et al. 2020](#)). In computer science, we have evidence that adopting pedagogical practices like Peer Instruction lowers failure rates ([Porter et al. 2013](#) and [Deshpande et al. 2019](#)) and raises student grades ([Simon et al. 2013](#) and [Zingaro 2014](#)). *By choosing to continue to lecture, rather than adopting an active learning pedagogy, CS educators are knowingly choosing to disadvantage URM students and perpetuating the inequity in the field.*

If you are willing to make a change to improve the outcomes of your students from underrepresented groups, there are already a number of great course materials ready to be adopted for two active learning techniques: [Peer Instruction](#) and [POGIL](#). Those wishing to adopt Peer Instruction should also feel free to contact me (leporter@eng.ucsd.edu).

Juan E. Gilbert, University of Florida:

CS educators have a role to play in addressing inequity issues in our field. This begins with understanding the issues yourself. Try to gain an understanding of the issues for yourself first. You can talk to experts about this who are knowledgeable. Look for ACM and IEEE resources that define the issues. You can reach out to the Broadening Participation in Computing alliances supported by the NSF or the NSF INCLUDES alliances. These are resources that can help you understand the inequity issues.

Next, talk to your students about the issues. You can integrate this into classroom discussions and/or do this one on one with students you mentor. Broaden the discussion to the department level and maybe the college. This will help institutionalize the discussions and actions that follow.

```
var self.understanding =
    inequity-issues-in-CS;
//gather for external resources, people, etc.

do {
    self.talk.students();
    //in person and in class

    self.executeClassroomProjectsOnInequities();

    department.talk.faculty();
    //discuss with faculty

    college.talk();
    //talk to chairs, dean and other
    //college administration

    department.assessment();
    //assess progress on a regular basis

    self.disseminate();
    //share experiences with SIGCSE
    //community and others

} while (inequities-exists-in-CS)
```

For additional information, please see my Guidelines for Diversity & Inclusion in Crisis, <http://www.juangilbert.com/CrisisGuidelines.pdf>.

If you would like to submit a response to the question “As a CS educator, how do you think we can address inequity issues that exist in the field?” please email your contributions to

- karen.davis@miamioh.edu or
- jeffrey.miller@usc.edu.

Member Spotlight

In this feature of the *Bulletin*, we highlight members of the SIGCSE community. In this issue, *Bulletin* co-editor Karen Davis interviewed Dr. Manuel A. Pérez-Quñones.

Dr. Manuel A. Pérez-Quñones is Professor of Software and Information Systems at the University of North Carolina at Charlotte (UNCC). His research interests include personal information management, human-computer interaction, diversity in computing, and CS education. He holds a DSc from The George Washington University and a BA & MS from Ball State University. He has published over 100 refereed articles. Before joining UNCC, he worked at Virginia Tech and University of Puerto Rico-Mayaguez, as a Visiting Professor at US Naval Academy, and as a Computer Scientist at the Naval Research Lab. He is originally from San Juan, Puerto Rico.

He has served as Program Co-chair (2018) and Symposium Co-Chair (2019) for the SIGCSE Technical Symposium, Program Chair (2014) and Program Co-Chair (2009) for the ACM Tapia Celebration of Diversity in Computing Conference. He has received numerous recognitions, including: Richard A. Tapia Achievement Award for Scientific Scholarship, Civic Science and Diversifying Computing (2017), CRA Nico A. Haberman award (2018), and ACM Distinguished Member (2019).



Manuel A. Pérez-Quñones
photo credit: Mike Fresina

How did you first get involved with the CS education community?

Several members of my family are educators, so working in academia was always a possibility for me. My first research publication was in SIGCSE '90, so early on I found a community that would eventually be a *home* for me. Still, for the early years of my work in academia, I was mostly focused on human-computer interaction research. Slowly I drifted back into CS education research and administration. I am grateful to the Computer Science department at Virginia Tech that viewed CS education research on equal footing with research in other areas of computing.

Could you describe some of the ways you've been involved in developing and enhancing computer science education?

As someone that has been in academia for almost 25 years, I have been involved in CS education in numerous ways. I supervised several PhD students researching CS education topics (co-advisor for Dr. Tracy Lewis and advisor for Dr. Scott Turner and Dr. Ashley Robinson). Of the 10 PhD students I have supervised, 5 of them are in academia. I have also been part of several funded research projects developing online tools and repositories for CS education. I was part of

the editorial board for ACM JERIC's journal and have been publishing in the SIGCSE Technical Symposium for over two decades. In the mid 2000s, I became a member of the Coalition to Diversify Computing, at the time a joint committee of the ACM, IEEE-CS and CRA. In that capacity, I was part of the larger Broadening Participation in Computing movement funded by NSF. I started participating in the Symposium more regularly, both as presenter and as part of the NSF BPC Alliances booth. Eventually, I was asked to be Program Co-Chair for the 2018 Symposium and Symposium Co-Chair for 2019. In 2019, I was elected to the SIGCSE Board as an at-large member, where I am now the Board Liaison to the Technical Symposium.

What have you learned during that time?

The computing education community is a vibrant one with lots of people with very different interests and motivations. Over the years, we have become more and more inclusive and more welcoming to others. I am forever grateful that some of the early pioneers of this community took me under their wing and mentored me about CS education, publishing at SIGCSE, etc. Little did I know at the time, that some of my collaborators had been SIGCSE Symposium Chairs and/or members of the SIGCSE Board. It has been a happy and odd coincidence that showed me a path forward within the CS Education community.

What are the biggest challenges you see for computer science education today?

For the 2019 Technical Symposium we generated a number of charts and graphs that depicted the growth in our community over its first 50 years. I learned that while some things haven't changed much (we still argue about which programming language we should use in intro courses), there are some really obvious and encouraging changes. For example, we have more participation of K-12 teachers in CS education today. That brings in a different set of

concerns and issues to study under the lens of education. Much has been written about the inequity of the educational system in the US, but there are a few places where this is more evident than in CS education in high schools. To see such a small but active community of K-12 educators eager to bring computing to high schools but also doing it with eyes wide open about broadening participation is fantastic. This is a recent wave that I think will only continue to grow.

I have also seen growth of more rigorous research in CS education. This is leading the discussion about teaching methods, students' learning and other concerns that exist at the crossroads of computing and education.

I have also seen diversity efforts to make computing education, and all of computing, more inclusive growing within our community. Without having the numbers, I feel comfortable claiming that SIGCSE is one of the most diverse SIGS in ACM. However, we have a long way to go before we can claim that we are the most inclusive. With diversity comes a need to be more intentional in our efforts for inclusivity. We are at that crossroads now.

The biggest challenge I see is the growth of the computing community. The pressure in handling bigger classes is taking a toll in many of us. Furthermore, with the larger enrollment in our academic programs comes a demand for more student services, and more options for students in terms of courses and degrees. The growth is also impacting conferences with a larger number of submissions and participants. This is a big challenge that we need to find a way to manage and to avoid pushing people away because we can't handle the increased demand.

What are the biggest challenges for diversity, equity, and inclusion in CS education today?

I can probably fill a book about this, but I will briefly mention three. I think the biggest challenge the field faces is understanding the value of role models and representation. If we don't see ourselves in our environments, it is really hard to feel welcomed. The second challenge is the retention of diverse talent across all of the levels of computing education: students, teachers, faculty, and administrators. Finally, we need more education for ourselves. We need to do a better job at learning about each other. I feel that the world is changing fast but we still see it with the lenses we put on when we were undergraduates.

You've been a leader in CS education in a variety of ways. What do you think are the biggest research challenges for us going forward?

I think we still don't know enough about how people learn to program, using the term in the broadest sense possible. There are people that pick up a book and learn programming on their own. But at the same time there are others that seem to struggle to get the most basic concepts. I have seen students that had excellent design skills (e.g., software decomposition, breaking down problem into sub-problems) but were not good at dealing with syntax errors. They were so frustrated with the "easy" stuff that they were ready to quit the major.

I think the growth in computing is making it clear that we need to take into consideration student motivation, styles of instruction, alternate paths to computing jobs, pedagogical design of programming languages, and many other topics that a few years ago might not have been considered *mainstream* in our field. Today with the push to increase diversity while at the same time manage the growth of the field, we have to expand and renew our efforts on learning how to teach computing.

What do you enjoy doing when you are not working?

- Spending time with family. During the pandemic, the four of us (wife and two kids) have spent most evenings either playing board games or binge-watching shows. We are currently watching the *Legend of Korra* after having watched *Avatar: The Last Airbender*. Unfortunately, the pandemic has also already canceled a trip to see my extended family from Puerto Rico.
- I enjoy reading science fiction, books about productivity, and books about diversity. Lately I have been trying to “decolonize my bookshelf” and read books by diverse authors. Inspired by my kids, in the last 4 years I have started reading comic books and graphic novels (again).
- Listening to music, particularly Latin Jazz and Salsa music. I love going to concerts. I have seen some really big names in music, including Fania All Stars, Dizzy Gillespie, Carlos Santana, Irakere, Eddie Palmieri, Tito Puente, Rubén Blades, Michel Camilo, Spanish Harlem Orchestra, David Sánchez, among many others. But lately, I have attended concerts that I never would have imagined attending. When your children ask you to take them to a pop punk concert, what do you say? I can add to my list of concerts Fall Out Boy, Paramore, Panic! at the Disco, All Time Low, Sleeping with Sirens, One OK Rock, Sum 41, Jaden Smith, and KISS. Talk about diversity.
- I love baseball and love going to major/minor league games. I have visited the four oldest baseball stadiums in use (Fenway, Wrigley, Dodger Stadium, Angel Stadium of Anaheim) and the newest one (SunTrust Park, Atlanta), as well as several others. I visited the Negro Leagues Baseball Museum (right after SIGCSE 2015!) but never been to Cooperstown.

- I love to exercise but a knee injury and several surgeries keep me from doing as much as I would love to do. I used to do a lot of running and played volleyball. Decades later, I still miss it, but try to remain active as much as I can.
- I enjoy watching weird educational TV shows, shows that talk about history and how ancient civilizations came to be and then disappeared. My family is always confused about my *unique* fascination with these shows.

Thank you, Manuel, for a fascinating interview. Speaking of science fiction and diversity of authors and characters, you might be interested in the [Future Tense Fiction project](#) at Arizona State University’s Center for Science and the Imagination. The site publishes a science fiction short story every month addressing “how will living with scientific upheaval and technological transformation change the world – and us?” Each story is accompanied by commentary from a real-world scientist or expert in a field portrayed in the story. I’ve read a few by African, Indian, Chinese, Latinx, and trans authors that include portrayals of non-white and non-heterosexual characters. They are all excellent. I would also recommend N.K. Jemisin’s 2018 collection of short stories entitled *How Long ‘til Black Future Month?*