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SIGCSE News in Brief

Welcome to the October 2022 issue of the *SIGCSE Bulletin*. This issue is the first for my new co-editor, Julie M. Smith, from the University of North Texas. I have appreciated Julie’s creative energy in the new role, particularly in exploring ways to provide the Bulletin in both a “classic” PDF format and a responsive HTML format that will work better online with smartphones and tablets. We hope to provide the 2023 *Bulletin* in that dual mode. (Thanks to Frank Vahid for pushing us in that direction.) I am glad to be working with Julie in the issues to come, and I am also grateful to the mentorship of Jeffrey Miller, who has stepped down from the co-editor position. He was patient and helpful as I learned the ropes, and I hope you’ll enjoy his reflections on CS education in the Member Spotlight for this issue.

In this issue, Brett Becker and Keith Quille give us a recap of July’s successful hybrid ITiCSE conference, and we have two invitations for

participation in upcoming conferences: Andrew Petersen and Ilkka Jormanainen describe the rapidly approaching Koli Calling conference in November, and Maureen Doyle and Ben Stephenson give an overview of the March 2023 SIGCSE Technical Symposium in Toronto, Canada.

This issue includes two contributions on equity, diversity, and inclusion in CS education. First, Chris Stephenson provides a summary of her report *All the Voices: Doing the Work to Improve Diversity, Equity, and Inclusion throughout ACM*. [The full report](#), including in-depth

interviews with ACM leaders and employees, is available online at sigcse.org/resources. Next, Yasmine Elglaly and Earl Huff describe their efforts to improve inclusion and access at the SIGCSE Technical Symposium through the Universal Design Committee.

We wrap up with Jeffrey Miller’s reflections on his long and successful efforts to engage K-12 students in computer science.

We hope you enjoy this issue! We encourage you to submit items of interest to the SIGCSE community. Our next issue will appear in January;

Upcoming Dates and Deadlines

Conference	Location	Dates	Full Paper Submission Deadline
Koli Calling 2022	Koli, Finland (hybrid)	November 17-20, 2022	(passed)
SIGCSE TS 2023	Toronto, Canada (hybrid)	March 15-18, 2023	(passed)
ITiCSE 2023	Turku, Finland	July 10-12, 2023	January 15, 2023

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

ITiCSE 2022 Recap: Boots on the Ground!

By Brett Becker and Keith Quille, Conference General Co-Chairs

The first hybrid ITiCSE – and the first to have in-person attendees in three years – was held in Dublin, Ireland from July 11-13, 2022, and it didn’t even rain! In total 376 attendees took part, including 240 in-person and 136 virtually.

From a record 276 submissions, 79 papers were presented in addition to several panels and 31 posters. Attendees were also treated to keynotes from Elizabeth Oldham of Trinity College Dublin, Titus Winters of Google, and Letizia Jaccheri of the Norwegian University of Science and Technology (NTNU), who captivated the

audience with tales and lessons from national computing education history and development, observations and experiences on the relationship between academia and industry, and efforts in gender diversity.

For three days prior to the conference, following a new structure where working groups do not overlap with conference sessions, nine working groups including 46 in-person and 43 virtual participants helped ensure that the pre-conference days were busy! In addition, 11 doctoral consortium participants (10 in-person) met in the two days prior to the conference.

The ITiCSE 2022 Best Paper Award went to Briana Bettin, Linda Ott, and Julia Hiebel of Michigan Technological University in Houghton, MI, USA, for their paper [Semaphore](#)

[or Metaphor? Exploring Concurrent Students' Conceptions of and with Analogy](#). In addition, two SIGCSE awards were received at ITiCSE 2022. Lauri Malmi was in attendance to receive the 2019 SIGCSE Award for Outstanding Contribution to Computer Science Education. Helen Purchase and John Hamer were in attendance to accept their Top ITiCSE Working Group Report (1996-2019) award, on behalf of their 2009 working group which also included Quintin Cutts, Jana Jackova, Andrew Luxton-Reilly, Robert McCartney, Charles Riedesel, Mara Saeli, Kate Sanders, and Judithe Sheard. Congratulations to all!

A special thanks to all of those who made ITiCSE 2022 possible including volunteers, the 2022 Committee and ITiCSE Steering Committee, the ITiCSE Sponsors (SIGCSE, ACM Europe, and Informatics Europe) and the ITiCSE Supporters (AWS In Communities, Google, GitLab, CodeGrade, Microsoft, Golden Key Education Publishing, Fáilte Ireland, and the National Forum for the Enhancement of Teaching and Learning in Higher Education).

It was a pleasure to see several hundred ITiCSE attendees from 23 countries face-to-face once again. See you in Turku, Finland in 2023.

Sin é!

Koli Calling 2022: Call for Participation
By Andrew Petersen and Ilkka Jormanainen, Koli Calling 2022 Co-Chairs

We warmly invite you to attend the 22nd Koli Calling International Conference on Computing Education Research (Koli Calling 2022), to be held 17-20 November 2022 in the beautiful Koli National Forest in Eastern Finland. 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. This year, we had a record number of submissions (up 20% from last year!) and are anticipating a strong slate of presentations.



Photo: Ilkka Jormanainen

We are also looking forward to a keynote provided by Professor Tiffany Barnes. Professor Barnes is a Distinguished Professor of Computer Science at North Carolina State University and a Distinguished Member of the Association of Computing Machinery (ACM). She is Founding Co-Director of the STARS Computing Corps, a Broadening Participation in Computing Alliance funded by the U.S.A. National Science Foundation. Her keynote, entitled “A grand challenge: Achieving equitable computer science education”, will discuss the core design features of STARS activities, conferences, communities, and networks that can expand equity-focused computing education research to a larger audience of researchers, educators, administrators, computing departments, and K-20 students, and can dramatically increase the number of people taking action in these efforts.

In this year’s submissions, we saw widespread interest in the learning value of informal and unusual environments (such as hackathons, Hour of Code, and in museums) and in problems of practice in the K-12 space. The conference will also feature work on hint and explanation systems and engagement with various types of exercises and assessments. Additionally, we are happy to welcome a number of systems and tools papers submitted under a new track specifically designed for them.

We are excited to be returning to our traditional in-person venue in Koli, where we can have

lively discussions of work in formal and informal settings. However, we will also be welcoming virtual visitors to the talks. We very much look forward to welcoming you to Koli!

SIGCSE Technical Symposium 2023: Call for Participation

By Maureen Doyle and Ben Stephenson, SIGCSE TS 2023 Symposium Co-Chairs

The 2023 Technical Symposium will take place in Toronto, Canada from March 16-18, 2023 at the Metro Toronto Convention Centre. This is the first time that the Technical Symposium has been hosted outside of the United States, though it's not outside the United States by very much – the convention center is only 20 miles from the U.S. border as the crow flies. The symposium's theme, 'Prepared for Anything', continues to be highly applicable to many areas of our lives, perhaps more applicable than we would like as we continue to navigate the complexities of teaching in a world that continues to be disrupted by COVID-19.

We are thrilled to announce our [two keynote speakers](#). Dr. Robert Thirsk will open the conference on Thursday, and Dr. Nichole Pinkard will be our closing keynote on Saturday.

The 2023 SIGCSE Technical Symposium will be a hybrid event that supports both in-person and online attendance. While running a hybrid conference is considerably more complex than a conference that only supports one modality, we believe that it is important to provide this flexibility to all attendees. Our hybrid experience co-chairs are working hard to offer an excellent online experience and to provide effective mechanisms for in-person and online attendees to interact with each other. While it isn't feasible for us to live stream all of the conference sessions, we are working to maximize the amount of content that is available to online attendees.

We are happy to report that the number of Round 1 submissions (papers, workshops, panels, and special sessions) received this year is similar to

the number of Round 1 submissions received for the 2022 Technical Symposium. This significant show of support from our community is greatly appreciated and we look forward to the strong and diverse program that the program co-chairs and their team are working to assemble. The deadline for Round 2 submissions (posters, lightning talks, demos, birds of a feather, student research competition entries and nifty assignments) is October 14, 2022. We look forward to receiving another healthy collection of submissions to these conference tracks.

Our 'Prepared for Anything' theme is also applicable to traveling to Canada. Even though the Technical Symposium is still approximately six months away there are some steps that you may need to take now to allow you to attend in-person. If you don't currently have a passport, we encourage you to apply for one as soon as possible. A passport is required for travel to Canada for everyone, including US citizens. Your passport needs to be valid for six months after your anticipated travel so if you currently have a passport, please check its expiration date and begin the renewal process if it expires before October of 2023. Additional information about traveling to Toronto and attending the 2023 Technical Symposium can be found on our [blog](#).

The conference organizers have decided, with the support of the Steering Committee, to require all in-person attendees to be fully vaccinated. Vaccination is a safe and effective way to reduce the severity of illness and minimize your risk of hospitalization should you contract COVID-19. The vaccination requirement will be implemented on the honor system with attendees attesting to their vaccination status during the registration process. This will eliminate the privacy concerns and other difficulties that were encountered with vaccine verification last year. It is also worth noting that, at the present time, the Government of Canada is requiring all foreigners visiting the country for discretionary purposes (such as conference travel) to be fully vaccinated and to provide evidence of such using the ArriveCAN app before arriving in Canada.

The decision to require vaccination is based, in part, on the feedback that was received on your evaluations from the 2022 Technical Symposium. We hope that this safety measure encourages you to attend in-person. Toronto is a beautiful city with excellent restaurants and fantastic views. It has the feel of New York without the crowds. The convention center is next to the CN Tower, where you can take an elevator to the observation deck for spectacular views of the surrounding area. In addition, the conference is located just two blocks from Lake Ontario! Toronto may be cold in March (though no colder than Minneapolis), but there are two conference hotels that have skywalks to the convention center and an underground mall will save you from braving the winter weather. Finally, if this hasn't been enough to encourage you to attend in-person then perhaps this additional tidbit will seal the deal! The 2023 SIGCSE TS will be in the newer south building of the convention center. While we are learning, sharing and connecting the north building will be bustling with activity as setup is completed for [Toronto Comicon](#). Grab your lunch on Saturday and then go and join the caped and masked masses for the remainder of the weekend as they celebrate all things pop culture.

Finally, we would like to extend our thanks to everyone involved in the organization of the 2023 Technical Symposium. An event like this simply isn't possible without the numerous dedicated volunteers and staff that contribute to it. All of their contributions are truly appreciated.

We look forward to seeing you at the 2023 SIGCSE Technical Symposium, either in Toronto or online. You can find more information about the conference at sigcse2023.sigcse.org.

Listening Within: ACM Employees and Leaders Articulate the Need for a More Diverse, Equitable, and Inclusive Organization

By Chris Stephenson, Past Chair, ACM Education Board

Events in 2020 created a moment of reckoning and a movement centered on and illuminating deeply ingrained patterns, processes, and prejudices of inequity and injustice faced by generations of Black Americans. Almost no institution was immune to probing questions concerning diversity, inclusion, and equity. Many professional membership organizations were also being asked to address the injustices manifested in their practices and traditions. Within ACM, however, the insider perspectives on this issue were not always clear. And so, from April until August 2021 I carried out research to determine whether ACM members, volunteers, staff and external experts believed that ACM should and could become a more diverse, inclusive, and equitable organization. This research is captured in a report entitled: [*All the Voices: Doing the Work to Improve Diversity, Equity, and Inclusion throughout ACM*](#).

The data for this qualitative student was drawn from interviews with current ACM employees, current and previous volunteer leaders of Councils, Committees, Boards, and Special Interest Groups (SIGs), and external diversity experts. Two survey instruments were developed and used for interviews lasting 30 to 80 minutes. The interviews were transcribed and each participant reviewed the text and provided any desired corrections or clarifications and any additional information they had forgotten to note during the interviews. The interview text was coded using a framework drawn directly from the interview questions. The interview process and data analysis were carried out simultaneously to reduce time between coding and analysis. This analysis surfaced seven major themes:

- Social justice
- The computing context

- Inclusion and representation
- ACM's leadership and decision-making structures
- Perception, progress, and expectations
- Opportunities for change
- Systemic and sustained change

Many participants recognized the importance of the moment and the social injustices driving the need for change:

George Floyd's murder and the response to it created an opening for organizations, volunteers, members, and staff to say what they've been thinking and feeling forever, which is, these things are broken and oppressive and we need to do something about it. I think it gives organizations a real opportunity to fix things that are broken and to do it in an active way. We're well past the opportunity for anyone to be proactive. We need to acknowledge that we need to address White supremacy in many forms and in all of our structures.

And some questioned ACM's willingness and capability for change:

I think there are parts of our community who don't believe that this should matter to ACM. They are not sure these issues fall within ACM's scope or possibility[sic] that the issues exist. Or they think these issues exist but not within our community.

There was also deep concern that ACM's failure to act, and to be perceived as failing to do so, would come at a very high price:

It's really important that ACM get this right, especially for younger members of our community. Some of them are starting to question the value of ACM and whether they should be members of an organization that doesn't understand or reflect the changing demographics. Our younger members are really looking for an organization that supports their values. . . ACM has to pay attention to what they are looking for now.

ACM's place within the computing field was particularly relevant to participants. Several noted that the ubiquity of computing should engender a strong sense of social responsibility among organizations and individuals in the field:

I think it's absolutely imperative that ACM have a public stand AND action items if they're willing to stand up for what they believe is right for their profession. We're not asking them to say what's right for the country, but within their profession, what are the expectations for people with regard to ethnicity, disability, and so on. If they're not willing to stand up for all of these people, then they have no business representing them.

The participants also recognized the complexity of responding to equity issues in an organization that is global in scope and should be global in perspective:

ACM has to sit down and do the serious work of figuring out how an international organization responds to issues that happen in any of the countries where they are based given that racism of some kind exists everywhere in the world.

Several also noted that ACM must look at diversity and representation in a way that is intrinsically inclusive:

There are many types of diversity in the ACM community: racial, ethnicity, gender, region, sexual orientation, ability/disability, and age. Technical area also has become a diversity area in the organization of ACM-wide activities. Each of these dimensions of diversity need to be represented in ACM.

Participants had differing opinions on how ACM had been, and could be, communicating about its DEI stance and efforts, but all agreed that direct, detailed, and sincere communication was essential.

Anyone can release a statement, but unless you are saying "This is what we're doing differently" or "This is what we commit to do very specifically," we don't just want to know that

you care. We want to know what you are going to do to make change. Give me the actions.

Several participants noted that the complexity and opacity of ACM's leadership and decision-making structures made change more difficult because it was hard to understand the distribution of power and the levers of influence that enable change.

What has surprised me is the understanding of the power dynamics between those two verticals [the staff and the volunteers]. I was at AAAS before so I am used to professional societies where there are these two verticals, the volunteers and the staff, but at ACM the staff seem to be powerless to make real change. This is just confounding.

Others pointed to the importance of budget allocations as an indicator of what ACM's volunteer leadership truly value:

The clearest indicator of ACM's willingness to improve diversity and inclusion would be hiring someone who's devoted to doing all this stuff. Show me your budget and I'll show you your priorities. Hire someone and give them a non-trivial budget to do real work.

The participants also called out the most public of ACM's activities as being in need of review and revision. These included elections, appointments, publications, and awards and recognitions. Participants also felt strongly that achieving substantive change in all of these areas requires strong metrics:

Measurement would be a signal to me that I may not see it all, but I know it's been measured and measured in a way that doesn't mask the data.

You have to read the report in its entirety to really understand the passion everyone interviewed brought to this topic. There is a deep desire and impatience for change. Sometimes, this desire manifests in steep criticism of ACM structures and processes which are believed to stand in the way of genuine commitment and progress. Some of the comments could lead you to assume that there is some anti-ACM

sentiment at work, even among long-serving volunteers. One thing I have found, however, in my years of looking at systemic change in volunteer organizations, is that the harshest criticisms almost always come from the people who love the organization the most, precisely because they want it to be its best possible self.

In June 2022, I had the opportunity to present the report and its thirteen recommendations. The good news is that the ACM Diversity and Inclusion Council has recognized these recommendations as being consistent with and supportive of their priorities and goals. Also, ACM has made substantive progress on many of these recommendations.

A Technical Symposium for All

By Julie M. Smith and Charles Wallace, SIGCSE Bulletin Co-editors; Yasmine Elglaly, University of Western Washington; and Earl W. Huff Jr., The University of Texas at Austin

Earl Huff and Yasmine Elglaly are spearheading an effort to make the SIGCSE Technical Symposium a more inclusive and accessible experience for all attendees. They describe the goals and plans of the recently formed Universal Design Committee.

You are the co-chairs of the Universal Design Committee for the SIGCSE Technical Symposium. What are the goals of this new committee?

The Universal Design Committee (UDC) aims to build an open and accessible environment for participation by members with different backgrounds and abilities. We achieve this by creating a framework that highlights the different activities related to SIGCSE and how to make these activities accessible and inclusive to all community members. For this year, we are focusing on improving the in-conference experience such as physical space considerations and virtual attendance. We expect to continue developing this framework as we learn from the community and receive their feedback and suggestions.

Can you talk a little about the history behind and the effort to build the Universal Design Committee?

Computer Science should be accessible and inclusive to all learners, as well as to all educators. As the SIGCSE community is leading innovations in CS education, it is vital to make participation in the various SIGCSE activities as inclusive as possible for all its members. With COVID-19 and the rapid transition to online platforms for academic events and activities, digital accessibility has become even more critical in supporting synchronous, asynchronous, and hybrid communication and learning. Hence, the UDC was formed to improve the inclusion and accessibility of the symposium. The creation process of the committee itself was transparent, and membership was open for self-nominations. The committee consists of members who enjoy diverse skills and abilities and represent diverse demographics with respect to gender, race, and ethnicity.

What are some ways in which Universal Design can transform the Technical Symposium?

The UDC aims to remove any hurdles so everyone can participate in any of the SIGCSE activities. This can only be achieved through an iterative process and continuous improvement.

We hope to transfer existing knowledge and learned lessons around inclusion, equity, and accessibility to the SIGCSE community. For example, there are already existing guidelines on creating accessible PDF files. We would like to share these guidelines with the SIGCSE TS authors so they may create accessible papers for their symposium submissions. Accessible submissions mean that reviewers who use screen readers or have a visual impairment will be able to review the manuscript without requesting accommodations. Similarly, we want to ensure that all online communications, including the conference website, the submission websites, e.g., EasyChair, and the final publications, are accessible. The UDC will inform other SIGCSE

committees of accessibility best practices related to their committee focus so that they may make more informed decisions, such as selecting digital platforms and physical spaces, with inclusion in mind.

Can you tell us a bit about your prior interests and activities and how they are applicable to Universal Design?

[Earl] My research interests are in accessibility in ICT and broadening participation in STEM. I have worked towards improving accessibility in online learning platforms for persons with disabilities (PWDs) through human-centered design and incorporating universal design principles. Serving on the SIGCHI Accessibility Committee gives me the perspective on how we can identify accessibility barriers at conferences and what work must be done to assess how they provide accommodations for attendees. Additionally, myself and several of my colleagues have created [the Papaya Project](#), which aims to identify and dismantle barriers in making computing education a more equitable and inclusive field. Our work has helped us see areas where participation in the CS Ed community is imbalanced due to long-standing practices and methods that need to be changed.

[Yasmine] My research interests are centered around accessible computing. I investigate how software development tools may better support the creation of accessible websites and mobile apps. I also study the various methods of teaching accessibility and universal design in computer science courses. I served on the Grace Hopper Conference scholarship committee, and I am a Community Ambassador at Western Washington University for supporting diversity, equity, and inclusivity (DEI). These experiences have deepened my understanding of how Universal Design principles can be applied to broaden participation in CS and create a welcoming and inclusive environment for participants with diverse backgrounds.

How do you see Universal Design fitting into efforts to improve diversity, equity, and inclusion in computer science education?

The Centre for Excellence in Universal Design defines Universal Design as “the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability.” As much as we wish to see this in the CS Ed space, currently there are numerous barriers that we must work collectively to examine and dismantle. The formation of the UDC and the eventual conception of the Universal Design Framework would be a first step towards tearing down some of those barriers that have long limited or prevented full participation and inclusion of marginalized individuals in SIGCSE. We hope that what we design may influence more conversations into how we make space for everyone to have their voice included in our community and make an impact on how we strive for DEI in CS Ed. Our SIGCSE community is in a unique position, as we are learners, researchers, and educators. Hence, accessibility knowledge may find its way to the educators’ practices in their own courses and their teaching practices. Raising awareness about inclusion and accessibility among SIGCSE members may influence not only the accessibility of the symposium but also the accessibility of other academic artifacts produced by the SIGCSE members. As we together learn how to make SIGCSE more accessible, we can also learn how to make our classrooms more accessible and further teach our students how to be inclusive and consider accessibility in their work.

Member Spotlight

By Julie M. Smith and Charles Wallace, SIGCSE Bulletin Co-Editors; Jeffrey Miller, Southern Utah University

In this feature of the *Bulletin*, we highlight members of the SIGCSE community. In this issue’s spotlight we hear from Jeffrey Miller, who has just moved from the University of

Southern California (USC) to Southern Utah University (SUU), where he is now serving as the Dean of Engineering and Computational Sciences. Jeffrey recently stepped down as Co-Editor of the *Bulletin*.

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

I always had a desire to teach, and when I was in high school, I was tutoring elementary school students in math. I went to the University of Southern California (USC) as a Computer Engineering and Computer Science major, and while I realized that I enjoyed the programming part of the field, I still had a passion for teaching. During my senior year, I asked one of my professors, Prof. Ellis Horowitz (who would become my Ph.D. advisor), what I needed to do to teach in college, and he guided me toward getting a Ph.D. I taught classes at California State University, Los Angeles, while I was working on my Ph.D., and then I accepted a tenure-track position at the University of Alaska Anchorage (UAA) after completing it. In my second year at UAA, Prof. Grant Baker, who was the Associate Dean in the School of Engineering, asked if I wanted to help build a K12 pipeline to engineering at UAA through a series of summer camp programs. I immediately accepted that opportunity and began looking into the research in the CS education community concerning K12 students that pursue CS careers.



Photo: Southern Utah University

Can you describe some of the ways you have been involved in developing and enhancing computer science education?

For over 10 years, I have run computer science outreach programs at UAA and USC, and they both are still running and having great impact. During my time with the programs, I have exposed over 10,000 K12 students to computer science through week-long and semester-long programs. My primary donor at USC is from the [Institute for Education](#), which is led by Coach Kathy Kemper. She and I share a vision to expose all K12 students to computer science. We broke down barriers related to ethnicity, gender, and family income, and the program is expanding to other universities across the country, including my current employer, Southern Utah University. There are different activities and programming languages that are used for different age groups. It's important to make sure kids are interested in what they are learning, so there is flexibility for the students to program based on their passions. For example, the class for students between the ages of 5 and 7 teaches them about storytelling, and each student creates his/her own characters and story. After drawing the story on paper, they make their story come to life by programming it. Every story is different, and each student incorporates different passions and interests into them. The pride they exhibit when they show their parents what they have created inspires kids, teachers, parents, and anyone else watching. The process of creating outreach programs and curriculum is one of the areas in which I have published in the CS education community, along with helping to create partnerships with different organizations to continue to expand the offerings.

In addition, I am honored to have been able to serve the CS education community as the SIGCSE *Bulletin* co-editor for the past four years.

Where do you think computer science education is headed in the next 5-10 years?

The education community in general has been in a box for the past 100 years or more. We have

told students that they need to learn based on the way we teach. When COVID-19 happened in spring 2020, the way most of us taught needed to change. In addition, we learned that some students thrived in this new model while others wanted a return to the previous models. More specifically, we hopefully have learned that education is not a one-size-fits-all model. No longer should students have to adapt to how we teach but rather we should adapt to how students learn. I often identify people who teach passionately as educators rather than teachers for the connotation that those words have. An educator is interested in how much students learn rather than how the information is disseminated. We need to continue with this mindset as we are evaluating possible changes to teaching pedagogy. If we keep the focus on how students learn, we will also be focused on individual students, which will help encourage more students from all backgrounds to enter the field.

What do you think are the biggest challenges facing the community?

The major challenge in computer science is scaling. As more students want to enter the field, we need to make sure we can accommodate the growth. Unfortunately, the number of faculty in the field has not grown at the same proportion as the number of students, so faculty and administrators have had to make some decisions (which do not always align). Should the class sizes increase? Should there be a capacity on the number of students in a program? Will additional teaching assistants in larger classes provide the same quality of education as fewer teaching assistants in smaller classes? Can active learning and flipping the classroom help to achieve the same learning objectives with more students? Will different class modalities allow more students in the field? I believe the answer to all these questions is, "Yes, but..." No scaling solution will be easy to implement while still maintaining high quality, but solutions with thoughtful implementation based on sound theories can support growth and quality. These

solutions will not come without an investment in time, money, and resources though. But hey, if there are more students entering the field, we have more time, money, and resources, right?!?

What are the biggest challenges for diversity, equity, and inclusion in CS education today? And what can CS educators do to help encourage diversity?

Although diversifying computer science (and other STEM fields, more generally) has been a topic of discussion for many years, the past few years have pushed these discussions into the forefront of many department meetings. I have seen in my own experience with these conversations that the focus is only on attracting more students of a specific demographic to the field. Instead, we should be focusing on how to expose all students to computer science with no exclusions. This requires educating all students, not just ones who are underrepresented, in understanding the increased success of diverse teams. The field needs to be welcoming to all students with the goal of building up their confidence so they know they are no less capable than anyone else. This inclusion must begin before college, before high school, and even before middle school. Elementary school students, as well as all other students, need to gain the confidence that they can pursue more education and succeed in computer science. If we can get younger kids to know this, the pipeline of students coming into the field when they reach college and the workforce will be more diverse.

What do you enjoy doing when you are not working?

I love being a husband and father, and my wife and I have three beautiful kids. We like doing activities as a family, such as biking, hiking, going to parks, swimming, enjoying good meals together, and above all, RV trips, especially cross-country ones.