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SIGCSE News in Brief

Welcome to the July issue of the SIGCSE Bulletin for 2023. Depending on your role and location, this might be a time of summer weather or winter weather, school break or continued research, and transitions from one role to another.

In this issue, we are pleased to share an announcement about a new and important SIGCSE award. We also have an invitation to the upcoming Koli Calling Conference.

The Bulletin also includes a piece by Yasmine N. Elglaly and Yudong Liu on the results of their SIGCSE Special Projects grant that focused on fairness issues related to machine learning, including the creation of curricular resources. Continuing the theme of ethical issues, this issue's member spotlight features Casey Fiesler, whose work focuses on ethics, particularly in relation to computer science education.

We invite you to contribute to future issues of the Bulletin by sending brief pieces of general interest to SIGCSE members to the co-editors.

Upcoming Dates and Deadlines

Conference	Location	Dates	Full Paper Submission Deadline
ITiCSE	Turku, Finland	July 10-12, 2023 (on-site only)	-----
ICER	Chicago, IL, US	August 8-10, 2023 (on-site/virtual)	-----
Koli Calling	Koli, Finland	November 13-14, 2023 (virtual) November 16-19, 2023 (on-site)	-----
CompEd	Hyderabad, India	December 7-9, 2023	-----
SIGCSE TS	Portland, OR	March 20-23, 2024	abstracts by August 11 and full papers by August 18

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

Announcing the ACM SIGCSE Broadening Participation in Computing Education Award

By Brett Becker

The SIGCSE Board is happy to announce that ACM has approved a new annual award to compliment the three existing SIGCSE awards. The **ACM SIGCSE Broadening Participation in Computing Education Award** recognizes an early career SIGCSE member who has made a fundamental and innovative contribution to broadening participation in computing education. The contribution may take many forms, such as curriculum design; outreach to underserved communities; creation of programs, policies or initiatives that increase representation in computing; publishing work that helps the community understand underrepresentation issues; or other significant contributions working towards broadening participation in computing education. Contributions can span any sector in computing education, including traditional primary,

secondary, and tertiary education as well as community-based educational organizations. Accordingly, the award is open to individuals that work in education or industry, provided their contribution has had an impact in broadening participation in computing education.

A winner will be selected from community nominations by a dedicated BPC Award Committee, separate from the SIGCSE Board. The selection process for all SIGCSE awards will also be made by separate award committees. This is a departure from the past whereby the SIGCSE board selected award winners for all but one of these awards. This is part of the SIGCSE Board’s planned DEIA actions to be implemented by December 2023, specifically “Identify and implement strategies to minimize bias and optimize inclusion in our processes for eliciting nominations and selecting recipients of SIGCSE awards” – for more information see the SIGCSE Bulletin Vol. 55, No. 2 (April 2023).

Finally, the award nomination requirements and submission process have been revised and

streamlined for the 2024 awards. Complete information including how to submit nominations can be found at <https://sigcse.org/programs/awards/>. Award nominations are due on September 1, 2023.

SIGCSE Technical Symposium 2024: Call for Submissions

By Lina Battestilli, Samuel Rebelski, Libby Shoop, SIGCSE-TS 2023 Program Co-Chairs

The SIGCSE TS is a forum for educators and researchers to share new results and insights around developing, implementing, or evaluating computing programs, pedagogy, curricula, and courses. The conference will be held in Portland, Oregon, from March 20 to 23, 2024 mostly in-person with a few limited online participation opportunities available to accommodate a broader range of attendees. Details will be available at the conference website: <https://sigcse2024.org>.

We invite submissions on topics including but not limited to: improved and scalable pedagogies; broadening participation; strengthening diversity, equity, and inclusion; K-12 and novice learners; leveraging data and analytics; peer learning and instruction; novel outreach; events and engagement strategies; involving students in solving social and global challenges; advanced CS topics; and education research – including qualitative and quantitative, instruments, null and negative results. The SIGCSE Technical Symposium provides many ways to share ideas, including papers, panels, special sessions, workshops, the ACM Student Research Competition, Birds of a Feather (BoFs), demos, lightning talks, nifty assignments, posters, and pre-symposium events.

We invite colleagues to contribute to, review for, and attend SIGCSE TS 2024. Once accepted submissions are finalized for publication, the proceedings are made available in the ACM Digital Library. At least one author

of an accepted work must register and attend the conference.

Key submission deadlines are:

- Friday, August 11, 2023: Paper Abstracts, Affiliated Events
- Friday, August 18, 2023: Full Papers, Panels, Special Sessions, Workshops
- Friday, October 13, 2023: Posters, ACM SRC, BoFs, Demos, Lightning Talks, Nifty Assignments

We are recruiting Reviewers and APCs (Associate Program Chairs). Volunteering your expertise to assist with the review process is a great way to get involved with the symposium and to ensure that the reviewing process is fair and informative to authors by giving them useful feedback. We cannot do this without the generous support from the community and we need over 800 reviewers for a successful and equitable review process. To volunteer as a Reviewer or APC for SIGCSE TS 2024, please complete this form by July 31, 2023: <https://tinyurl.com/review-SIGCSE24>

If you have any questions, please contact us at program@sigcse2024.sigcse.org.

We look forward to a great SIGCSE Technical Symposium 2024!

Koli Calling 2023 Invitation

By Andreas Mühlhling and Ilkka Jormanainen



Photo credit: Ilkka Jormanainen

We warmly invite you to attend the 23rd Koli Calling International Conference on Computing Education Research (Koli Calling 2023), to be

held both online, 13-14 November 2023 and in Koli, Finland, 16-19 November 2023 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. We are excited to be back to an in-person event for the second year now. Following the experiences and discussions among the program committee after last year's hybrid event, we have decided to try a new format, hoping to bridge the intimate atmosphere and lively discussions that Koli is renowned for with the opportunities of broadening participation of an online event. Therefore, all accepted research papers will be presented in the online part of the conference following a more standard format of presentation, while all discussion papers will be presented in the in-person part with a more open format to initiate discussions among the participants.

We are also looking forward to a keynote provided by Professor Teemu Roos, Department of Computer Science, University of Helsinki, Finland with the title: "What about a Ploughman or a Keeper at the Zoo: Survival (Thinking) Tools for the Generation AI". Teemu Roos is the lead instructor of the Elements of AI online course that has a pivotal role in Finland's unique, inclusive AI strategy, with over one million participants. Roos is a Professor of Computer Science at the University of Helsinki. He is also the leader of the AI Education programme at the Finnish Center for AI. His research focuses on statistical machine learning and its applications in physics, neuroscience, and epidemiology, as well as AI education.

We hope that many of you join us at Koli Calling 2023, be it online or personally in Finland and help us to make this conference as enjoyable and memorable as in the previous years!

Promoting Machine Learning Fairness Education through Active Learning and Reflective Practices

By Yasmine N. Elglaly and Yudong Liu, Western Washington University

Overview

As Natural Language Processing (NLP) has witnessed significant progress in the last decade and language technologies have gained widespread usage, there is an increasing acknowledgement that the choices made by NLP researchers and practitioners regarding data, methods, and tools carry significant ethical and societal implications. Consequently, there arises a pressing need for integrating ethics education into computer science (CS) curriculum, specifically within NLP and other related machine learning (ML) courses.

In this project, our primary objective was to highlight the importance of fairness in ML ethics. We aimed to raise awareness regarding biases that can exist in machine learning, such as gender bias and disability bias. Acknowledging the intricate nature of the intersection between machine learning, ethics, and bias, we formed a participatory group comprising professors and students to develop the teaching interventions. The group members have experiences in machine learning, accessible computing, or both. It was crucial to include students in the design process of the teaching interventions because we wanted to ensure that fairness is sufficiently covered without being too complex to understand or too subtle to recognize [[Tseng et al., 2022](#)].

Fairness of NLP Teaching Interventions

We developed a series of three teaching interventions, which are available on [Github](#), intended to be implemented sequentially within an NLP course. The first teaching intervention comprised an [assignment](#) that covered the technical aspects of word embeddings while also providing an overview of bias using examples of race and gender bias. The assignment was followed by a take-home [quiz](#)

that aimed to assess gender bias in the transformer language model BERT and familiarize students with fine-tuning techniques used to mitigate such bias. The second intervention involved a [lecture](#) on bias in NLP, with a specific focus on disability bias, accompanied by detailed examples from relevant literature. The third intervention involved presenting students with a list of projects related to fairness, from which they could choose their [final project](#). Additionally, all students were encouraged to critically evaluate the ethical implications of their own developed systems throughout the project.

For all interventions, we added reflection questions as part of the assignments. For example, in the final project students were asked: What does a fair AI system mean to you? Do you consider your system in this project fair or biased? Please explain. How could you improve the system in terms of fairness?

Evaluation of the Teaching Interventions

The three teaching interventions were employed in an NLP course at Western Washington University. It is an elective course offered to both undergraduate and graduate students. The course was taught in Winter 2022 synchronously on Zoom in the first three weeks due to COVID-19 and in HyFlex (hybrid flexible) format thereafter. In HyFlex format, the class was held in-person and simultaneously livestreamed on Zoom. The majority of the students attended via Zoom throughout the course. In total, 19 undergraduate students and 15 graduate students completed the course.

To assess the impact of the teaching interventions, we analyzed the students' responses to the reflection questions over the three interventions. In addition, we interviewed six students upon the conclusion of the course, two of whom were graduate students. The interviews included questions on whether and

how the interventions contributed to the students' understanding of bias and fairness in NLP. The interview process was approved by the IRB office at our institution.

The students' final grades in the course were in line with the results of previous years, indicating that the implementation of the new interventions did not hinder their academic success. Through the analysis of the students' responses to reflection questions and interviews, we observed that the students demonstrated their comprehension of the origins and reasons behind biases in models, as well as their grasp of techniques to address and mitigate these biases. Students showed understanding of various types of biases, such as gender bias, in addition to the stages within the NLP model creation process where bias could be introduced or amplified. Furthermore, the majority of students expressed the belief that the knowledge and skills they acquired in machine learning fairness were highly applicable to their future careers. In fact, all interviewed students unanimously expressed their desire to see the topic of fairness integrated throughout the entire CS curriculum, extending beyond just machine learning courses.

A small number of students stated that bias issues in NLP reflect the existing biases prevalent in society and did not recognize the ethical implications of transferring existing biased data as-is from its original sources to the domain of ML. The analysis of the final project reports indicated that most students reflected on gender bias, aligning with the bias example presented in the assignment. A few students though expanded their reflections to encompass the needs of other user groups, such as individuals with disabilities. These students drew inspiration from the lecture, which emphasized the importance of considering fairness in relation to individuals with disabilities.

Conclusion and Future Work

We have developed teaching materials that address fundamental NLP topics, with a specific focus on fairness as an integral aspect of machine learning ethics. These teaching interventions can be readily adapted for implementation in other related courses, such as machine learning and deep learning. Through these interventions, NLP students have gained an understanding that ML-powered systems should be designed to be inclusive and effectively cater to protected groups, including individuals with disabilities.

Our future plans include incorporating lessons on bias solutions and strategies to actively promote fairness. We want to further explore into the realm of fairness education, expanding the coverage of topics such as data consent ethics and machine learning fairness considerations for individuals with physical disabilities and neurodivergent individuals. In order to deepen students' understanding of the risks associated with ML biases, we anticipate adding diverse forms of ethics education, such as case studies and debates, to the curriculum. These interventions will provide students with valuable insights and critical thinking skills necessary for navigating the complex ethical dimensions of machine learning.

Member Spotlight

By Julie M. Smith and Charles Wallace, SIGCSE Bulletin Co-Editors; Casey Fiesler, University of Colorado Boulder

Casey Fiesler is an associate professor of Information Science at the University of Colorado Boulder, specializing in technology ethics, internet law and policy, and online communities.



Photo credit: Casey Fiesler

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

When I was a PhD student at Georgia Tech, I taught the required undergraduate computer science ethics and professional responsibility course, and as one of the founding faculty of Information Science at University of Colorado Boulder, I also had the opportunity to think deeply about how ethics, justice, and social impact appeared not only in my own classes but our entire curriculum. I started thinking about pedagogical strategies around this topic, trying out new things, though not yet as a research area. And this part of the story is a bit tongue-in-cheek, but it's true: in 2017, there was a *New York Times* op-ed that accused academics of being "asleep at the wheel" when it comes to ethics in tech. In response to further conversation around this ("that's so true, why aren't they teaching ethics to computer science students!"), I created an openly editable Google spreadsheet and tweeted it out, asking that everyone add links to the syllabi for their tech ethics classes. It was up to about 200 entries pretty quickly, and as a result of this spreadsheet, some people started to assume that I was an expert on ethics education in computing. So being a new assistant professor fueled by imposter syndrome, I immediately decided that this meant I had to become one! I started with an analysis of those same tech

ethics syllabi to understand the state of the field, and then moved into creating and evaluating curriculum, and conducting further research into current and best practices for CS ethics education.

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

One of the things I love about conducting education research is its potential for immediate impact. The work that I do on research ethics has a similar quality; for both of these areas, the most immediate audience for research papers (academics) is also the intended audience for the message. When I write a paper about, for example, content moderation on social media, it's possible that someone who works at Facebook will see it and take some lesson that could have a real impact – but it's much more likely that when I write a paper about strategies for integrating ethics into a computing class, a professor who sees my SIGCSE talk will try something out in their classes.

Over the past five or so years (particularly since my involvement with the Responsible Computer Science Challenge), my lab has been creating, evaluating, and sharing ethics-related assignments, for example, for introductory programming classes. I know that some of these have been used in classrooms, but in particular, a teaching exercise I created called The Black Mirror Writers Room has been very popular and implemented by dozens of instructors across the world. It serves as a great way to not only get students thinking about unintended consequences and practicing speculating about technological harm, but also just as a way to bring creativity and collaboration into any computing class.

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

Even in just the eight years since I started my faculty position, I have seen a huge increase in attention paid to the role of ethics and related concepts (e.g., responsibility, justice) as well as

DEI in computing education. Along with this important shift I've observed more calls for interdisciplinarity—for example, hiring faculty with humanities backgrounds into computing departments, or requiring that computing students take more of a breadth of coursework. And I've also been thrilled to see a lot more acceptance for the idea that these topics should be part of technical computing classes as well. I think that we are moving towards even more breadth, less silos, and more appreciation for the broader impacts of what we are doing in the classroom. Optimistically, I think that these strides we are making in the way we teach computing students now will have a big impact on the impact of technology on society in the future.

A metaphor I sometimes use is that of a construction site. There is someone whose job on a construction site is to be the safety engineer – this is a specialization that someone is explicitly trained to do. But that doesn't mean that if the person putting up the drywall sees a rusty nail sticking out of the floor, they think “oh, well, I guess that's for the safety engineer to deal with.” Hopefully that person knows how to deal with the rusty nail themselves. But if they don't, they should know enough to recognize that it's unsafe and ask the safety engineer for help – or at the very least, not to put the rusty nail there on purpose. I truly think we can get to a place where ethical consideration is an explicit part of every technologist's job, and that they are adequately trained to do so.

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

Despite my optimism about movement towards more breadth and interdisciplinarity, I still think that narrow visions of what “counts” as computer science is a significant obstacle. Many people still see ethics as an elective

specialization (both in the classroom and in practice), or worse, as a distraction. (“Oh, I’m just the engineer.”) Part of the movement towards “this is everyone’s job” needs to be a recognition that ethical consideration is part of the technical practice of computing. So are topics like accessibility, inclusivity, safety, and justice.

Subfields of computer science that are highly concerned with these issues, for example ethics or human-computer interaction, are sometimes delegitimized as not being “real” computer science. Coincidentally, these are also the subfields that tend to include a lot of people from historically excluded groups. We should be emphasizing education in these areas and lifting up marginalized voices who have long been making the biggest contributions to critical conversations on societal and human impacts of the technology we build. We should be hiring ethicists into computer science departments, giving them tenure, and legitimizing their research area. Not only will this help emphasize that these topics are critical to the practice of computing, but it might also help attract a more diverse student body.

What do you enjoy doing when you are not working?

Sometimes making TikToks feels like work, so I’ll say that I’m creative in a lot of other ways, too! I knit, and play Dungeons & Dragons, often at the same time. Also ask me about my novel sometime. I think the CS education community would like it! I just need to finish revising...