

Going Through A Process of Whitening: Student Experiences Within Computer Science Education

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ABSTRACT

Since its conception, Computer Science Education (CSEd) has been treated as if it were disembodied, ahistorical, neutral, and benevolent. However, CSEd pedagogies, curricula, tools, and ideologies have intentionally and unintentionally reproduced, reinforced, and reinscribed existing inequities. The values, biases, ideologies, and histories in CS (education) are often a reflection of, and shaped by, the dominant values, biases, ideologies, and histories that displace and erase the historical contributions of non-dominant groups. This workshop will serve as a means of critically, reflexively, and reflectively examining the impact of race and racism in CSEd. Beginning with the development of a shared understanding of key frameworks in anti-racist theories, the workshop will center historicities and 'outsider' knowledge to build from and examine these theories within a CSEd context. The workshop will feature group-based interactive activities for identifying, explaining, and finding ways to address bias, discrimination, and stereotypes within CSEd.

CCS CONCEPTS

• **Social and professional topics** → **Computing education.**

KEYWORDS

race, racism, whiteness, student experiences

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1 SIGNIFICANCE OF THE WORKSHOP TOPIC

African American Studies scholar Ruha Benjamin and learning scientist Audrey Watters challenged researchers to explore their respective disciplines' "imaginaries" to reveal what values shape the beliefs and practices central to their discipline [1, 10]. In this workshop, we will seek to explore Computer Science Education (CSEd) "imaginaries" by thinking through:

- (1) Who has—and has not—been given the right to participate in CSEd,
- (2) Who is allowed to exclude others from participating, and
- (3) What are the methods of inclusion/exclusion.

The CSEd community needs this kind of critical reflexivity, otherwise, the community will unintentionally reproduce and reinforce existing inequities within the designs of pedagogies, ideologies, studies, curricula, and tools, and continue to be a space that lacks diversity. In this workshop, we will think through the current designs of pedagogies, ideologies, studies, curricula, and tools to consider how inequities have been embedded within them and how we, as a community, have contributed to those inequities.

Inspired by our own experiences as racially and ethnically minoritized CSEd graduate students and early-career researchers, we sought to explore the "process of whitening" [8] we went through to have our research and identities as researchers in the CSEd community considered "valuable." CSEd is treated as if it's disembodied, neutral, and benevolent. However, it seems that legacies of racism and white privilege determine what research matters and who gets to participate. This creates a community with a power dynamic wherein researchers who are "other" have to buy into research practices and narratives—that are often racist and sexist—as a way to gain social capital to be considered "researchers."

For instance, there exist CSEd scholarship that seeks to understand "the other" by exploring how race and ethnicity impact representation in the field and discipline, access, and learning in computing. This scholarship argues that non-dominant students are

not engaged [5], don't feel like they belong [7], or lack some cognitive ability [2]. We, as a community, then design curricula, or create tools and interventions based on these deficit ideologies that reify these beliefs and lead minoritized students to assimilate into a normalized, "settled" identity. This follows a typical racist narrative, where the construct of race is used "to answer the question of why people who are doing well are blessed, and to state that those that didn't do well must have something wrong with them," thus reproducing race [4]. One of the goals of this workshop is to complicate these narratives by considering what research questions the CSEd community investigates, what stories are told about students and participants, and what theories and knowledges are currently referenced and "foundational" for understanding.

Throughout this workshop, we will require participants to think through and reflect on how we can develop an anti-racist CSEd research and teaching community. To do so, we will rethink our foundational theories and specifically center historicities and engage "outsider" knowledge to analyze and challenge the impact of racist, and intersectional, inequities. We will encourage the use of "cite your momma" as a way of bringing in our and participants' own "knowledge, and rejecting our miseducation" [6]. In our workshop, we plan to explore questions centered around *why*, *what*, and *how* (Section 3) as a way to begin a discussion on a coherent theory of what race is and how racism operates.

We want to stress that this workshop is not meant to be solution-oriented. That is, participants will not leave the workshop with concrete solutions about how to address racism in the CSEd community. We cannot possibly address racism if we do not fully understand the problems. Any solutions built or designed may only end up being reforms/tweaks over real change. Instead, we hope to continue the much needed conversation about how to address bias, discrimination, and stereotypes within CSEd. We expect participants to leave the workshop with a better understanding of ways to identify and address the many forms of discrimination and inequities that may exist within their own classrooms and communities, and strategies that transform CSEd into a more inclusive and accepting field.

2 EXPERTISE OF PRESENTERS

The presenters are early-career researchers in computing education: doctoral students and postdocs who represent populations often facing inequality, discrimination, bias, and differential access to opportunities. The presenters have personal experience navigating the field and research community of CSEd, encountering racial barriers in the space. Many of the presenters have conducted research and published work regarding equitable access to opportunities in computing and challenges in recruitment and retention of people of color in CS.

Positionality of Presenters.

- **Earl Huff, Jr.** is a Black doctoral candidate in Human-Centered Computing, researching accessible computer science education for students with visual disabilities.
- **Francisco Castro** is a Filipino postdoctoral researcher. His research is on the human-centered design of computing curricula and technologies for diverse learners in CS and non-CS contexts.
- **Gayithri Jayathirtha** is an international doctoral candidate in the school of Education researching about supporting K-12 computing classrooms with curricular tools to create equitable learning opportunities for diverse students.
- **Yerika Jimenez** is a Latina doctoral student in Human-Centered Computing at the University of Florida. Her work focuses on bridging the gap between minority K-5 students and their lack of accessibility and exposure to CS.
- **Minji Kong** is a Korean doctoral student in Computer Science researching process-oriented analytics of diverse novice programmers' learning and behaviors in block-based environments.
- **Natalie Melo** is a Brazilian-American doctoral student from a first-generation, low-income background. She researches pedagogies and learning combining critical theory and technology studies.
- **Amber Solomon** is a Black doctoral candidate in Human-Centered Computing. Her research focuses on how embodiment is used in CS learning.
- **Jennifer Tsan** is a Asian American doctoral candidate in CS. She researches how to support upper elementary students learning CS collaboratively.

3 AGENDA FOR THE WORKSHOP

We propose a three-hour, four-part workshop hosted on the Discord platform [3] (Table 1). In the workshop, we will address the questions of *What* (defining key concepts), *Where* (where do we find racism and inequities), and *How* (how do we move forward from the *Whats* and *Wheres*).

At the conclusion of the workshop, participants will have not only actively reflected on their experiences in the light of anti-racist theories, but also adopted these ideas into reimagining and redesigning tools and structures to promote equity, increase diversity, and advocate for diversity within CSEd.

3.1 Part I: Introductions & Part II: The What

The presenters will introduce themselves and provide an overview of the workshop.

Part II will address the *What* of the workshop by establishing a shared understanding and language for key ideas drawn from anti-racist theories and frameworks. Each of the eight presenters will lead small-group discussions to establish a shared understanding among participants and provide a common language for the rest of the workshop. Participants will be randomly placed into different Discord channels with 3 to 5 participants per group. Participants will brainstorm ideas around key constructs to make explicit the otherwise pervasive and overlooked racist phenomena (e.g. bias and stereotypes, oppression, systemic racism, microaggression, exclusionary practices, whiteness and assimilation, etc.).

3.2 Part III: The Where

Part III will address the *Where* of the workshop by discussing exactly where we find racist practices within CSEd and how these get propagated into research practices and the design of tools, curricula, etc. To engender socialization further, participants will be encouraged to move to new groups. Participants will reflect on

Table 1: Overview of workshop agenda

Part	Location	Duration	Activity Schedule
I	Main Hall	15 minutes	Introductions: brief socializing to get to know one another
II	Small-group channels	30 minutes	Language & Definitions: presenting definitions, common language & key ideas
III	Small-group channels	45 minutes	Reflection: accounts of discrimination within CSEd
Break (15 minutes)			
IV	Small-group channels	45 minutes	Reflect, Imagine & Design: design activities to reimagine CSEd
	Main Hall	30 minutes	Share out: presenting and exchanging ideas

their own experiences as researchers, teachers, and students within CSEd in terms of the ideas discussed earlier during the workshop.

Organizers will share their personal stories to make room and create a space of trust among participants. Participants, similar to the organizer's modeling, will be encouraged to organize their thoughts around three primary questions: 1) *What happened?*, 2) *Where did this happen?*, and 3) *How did it happen?*, as they reflect on their "whitening" experiences. The organizers will take notes and encourage participants to make connections and utilize the recently discussed frameworks and language to communicate their experiences. Towards the end of this sub-session, the group members will be invited to compile their stories and identify the implications of these experiences on the larger CSEd community: how values, practices, and structures are organized, and how tools within the community are designed, which lead to certain kinds of participation. There will be a 15-minute break between Parts III and IV.

3.3 Part IV: The How

As previously stated, this workshop is not meant to be solution-oriented. Therefore, in Part IV, we will begin to think through how we might move forward as a community. Tools such as curricular materials, learning activities, and community building structures will be revised to be inclusive and transformative for the diverse community members. Participants will reorganize into small groups to reimagine and redesign one of these aspects of the community.

Each small group will be provided with an example of a redesigned learning activity, a curricular unit, and a socializing event within CSEd. Organizers will encourage participants to draw from their personal accounts as they expand upon these redesigned structures and spaces. We hope the final share out session will also further generate some motivation for participants.

To conclude the workshop, everyone will assemble in one channel for the last 30 minutes to share their redesigned artifacts with the larger group of participants.

4 AUDIENCE, ENROLLMENT LIMIT, AND REQUIRED EQUIPMENT

We expect a maximum enrollment of 40 graduate students and early-career researchers who are interested in, or currently conducting research in computing education. As participation is crucial for our workshop, our objective is to keep the workshop environment a safe space for participants to share their thoughts. We chose to omit perceived "authority figures", such as faculty, from our expected audience as participants may not be as open or candid

in reflecting on their experiences during the workshop in their presence. The required equipment is a computer with reliable access to the Internet, video camera, and microphone.

5 ADVERTISEMENT

The work of reimagining what is possible within and in relation to STEM learning rests on, indeed relies on, critical understandings of how current foundations of STEM education invoke, reinforce, reflect, and refract anti-Black, settler-colonial, and neoliberal sociopolitical structures and ideologies in society [9].

This workshop will provide a space for graduate students and early-career researchers to discuss the cultural, racial, and intersectional disparities within the Computer Science Education (CSEd) field. The workshop will feature group-based interactive activities designed to identify, explain, and find strategies that begin to address bias, discrimination, and stereotypes within CSEd. Through reflections of personal experiences, collective discussions, and feedback, we hope participants will walk away with a better understanding of identifying and addressing the many of forms of discrimination and inequities that may exist within their own community and help work towards making the field of CSEd a more inclusive and accepting discipline.

Participants will need a computer to access both Discord and shared documents for collaboration (e.g. Google Docs and Slides).

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