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Connecting Race to Ethics Related to Technology: A Call for Critical Tech Ethics

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Abstract: Critical tech ethics is my call for action to influencers, leaders, policymakers, and educators to help move our society towards centering race, deliberately and intentionally, to tech ethics. For too long, when "ethics" is applied broadly across different kinds of technology, ethics does not address race explicitly, including how diverse forms of technologies have contributed to violence against and the marginalization of communities of color. Across several years of research, I have studied online behavior to evaluate gender and racial biases. I have concluded that a way to improve technologies, including the Internet, is to create a specific type of ethics termed "critical tech ethics" that connects race to ethics related to technology. This article covers guiding theories for discovering critical tech ethical challenges, contemporary examples for illustrating critical tech ethical challenges, and institutional changes across business, education, and civil society actors for teaching critical tech ethics and encouraging the integration of critical tech ethics with undergraduate computer science. Critical tech ethics has been developed with the imperative to help improve society through connecting race to ethics related to technology, so that we may reduce the propagation of racial injustices currently occurring by educational institutions, technology corporations, and civil actors. My aim is to improve racial equity through the development of critical tech ethics as research, teaching, and practice in social norms, higher education, policy making, and civil society.

Key words: race; gender; ethics; tech; bias; equity; society; policy

1 Sociocultural Introduction

It is July of 2020, and I am writing this article during a time of racial unrest and personal loss. A few months ago, George Perry Floyd Jr, a Black man, was killed by a White police officer, Derek Chauvin, who knelt on Floyd's neck for nearly eight minutes. Like many activists, I participated in protests to draw attention to continued racism, police brutality, and racial injustice. Located in Alabama, I marched in my hometown's Black Lives Matter protest, where police snipers were stationed at the tops of buildings, poised to shoot ordinary citizens of different races engaged in peaceful activism. George Floyd's murder occurred during the COVID pandemic, which attacked both of my parents, causing them both to be hospitalized and intubated. My daddy died within a week of George Floyd's death.

I provide details about this particular sociocultural moment to make the point that the time for a closer inspection of how race relates to ethics and technology has arrived. Over the past few months, I have received dozens of emails from companies and organizations stating their condemnation of racism, promotion of equality, and support of inclusion. Entire associations are now stating that Black Lives Matter. They are stating that anti-Asian racism and medical racism related to COVID, which my family experienced[1], are wrong. This country is examining racial injustice across a variety of contexts, including sports, crime, politics, medicine, and technology. If there is a time to call for critical tech ethics, it is most assuredly right now.

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2 Article Outline

Critical tech ethics is my call for action to influencers, leaders, policymakers, and educators to help move our society towards centering race, deliberately and intentionally, to tech ethics. For too long, when "ethics" is applied broadly across different kinds of technology, ethics does not address race explicitly, including how diverse forms of technologies have contributed to violence against and the marginalization of communities of color. Across several years of research[2−11], I have studied online behavior to evaluate gender and racial biases. I have concluded that a way to improve technologies, including the Internet, is to create a specific type of ethics termed critical tech ethics that connects race to ethics related to technology.

This article covers:

• Guiding theories for discovering critical tech ethical challenges;

• Contemporary examples for illustrating critical tech ethical challenges;

• Institutional changes across business, educational, and civil society actors for teaching critical tech ethics and encouraging the integration of critical tech ethics with undergraduate computer science.

3 Guiding Theories

The theories that inform this article are all drawn from critical theory, including critical race theory, intersectional feminist theory, and critical race feminist theory. In this section of the article, I briefly highlight significant components of all three related theories to demonstrate how their contributions on race, gender, and diverse axes of identity intersect with digital media ethics to create critical tech ethics.

Both critical race theory and intersectional feminist theory emerged in the 1980s[12, 13]. Immediately, critical race theory became popular within academia, especially in the fields of law and education. In contrast, though intersections of race with gender had been highlighted by prominent feminists of color in the 1980s[12], intersectional feminist theory was slower in its adoption, not gaining widespread recognition until the 1990s[14].

Critical race theory has at least three tenets that are relevant directly to critical tech ethics[13]:

• Concepts that are held as "race-neutral" are tied to White supremacy and racism.

• Racism is acknowledged as ordinary, fundamental, and embedded within American society.

• Awareness of examples of hegemonic Whiteness should lead practitioners of critical race theory to create and support interventions to transform social structures and advance social justice.

Intersectional feminist theory informs this article by stressing the concurrent ways that axes of identity are activated in their oppressions[12]. Specifically, the applications of intersectional feminist theory used in analyses for this article are:

• Race alone and gender alone are not adequate ways to analyze the results of the inputs and outputs related to online behavior.

• The intersection of race with gender lends important insights into understanding the inputs and outputs related to online behavior.

Finally, critical race feminist theory, as the name implies, combines components of critical race theory with intersectional feminist theory[15]. In fact, key advocates of both critical race theory and intersectional feminist theory have helped to form critical race feminist theory. Since the mid-1990s, critical race feminist theory has been forming adherents, but it lags in popularity behind critical race theory and intersectional feminist theory.

The key reminders from critical race feminist theory most applicable to this work are[15]:

• The socially-constructed categories of race with gender should not be reduced to essentialism. In other words, women of color, men of color, and people of color who do not identify with binary gender experience the world differently from one another across genders, which is a presumption that is different from earlier forms of critical race theory that lumped men and women of color together under the umbrella term of race.

• Women and people of color who do not identify with binary gender are not monolithic. Perceived differences across racial and ethnic divides influence concepts of what it is to be Indigenous, African American/Black, Asian/Asian American, Latina/Latine/Latinx, Caucasian/White, and so on. The presence of one woman of color online is not representative of all women of color, particularly across ethnicities.

Critical race theory[16], intersectional feminist theory[17], and critical race feminist theory[15] encourage special attention be paid to race and gender. Following

such traditions set by scholars of color, I use this article to illustrate why and how critical tech ethics should be developed as an area that connects criticality around race and gender with technology ethics, including digital media. Indigenous scholar Ess[18] has defined digital media ethics as addressing the moral principles related to activities conducted via computing technologies and online systems. A data practice that I challenge is how acritical and supportive of the status quo "ethics" in artificial intelligence, computing technologies, and online systems has been. Digital media ethics has been heralded as a way to consider the social good, producing tech conferences devoted to the combination of ethics with artificial intelligences. Ethics is the current buzzword for the funding of grants for civil and academic artificial intelligence projects[19]. But how often does tech ethics explicitly engage with racial equity? I explore answers to this question here.

After presenting real-life examples illustrating ethical challenges that are not race-neutral, I advocate institutional changes for teaching critical tech ethics and marketplace changes for encouraging the integration of critical tech ethics into undergraduate computer science education. Though intersectional feminist theory does not include an action component in its application, critical race theory does emphasize interventions as part of analyses. I use the latter sections of this article to critique the algorithms that control so much of our online behavior and highlight interventions that could empower future technology builders to create a healthier Internet for all.

4 Online Images

Images influence our conceptions of the world[20, 21], and yet, they are often overlooked in examinations of computer-mediated communication[22, 23]. I use online image searches to highlight the reflexivity between society and technology in (re)producing contemporary American socioeconomic politics, while concurrently shaping attitudes, decisions, and actions about race and gender.

I am a woman of color in the academy. When I entered the keyword of "professor" in an online image search, the algorithm produced a screen full of thirty images[4]. Using critical visual discourse analyses, I examined the presence and absence of diverse embodiments for professors in images from online searches. Of those results from the screen, 87% of the images were highly biased in terms of age, race, gender, and appearance. Twenty-six images were variations of elderly, White men that wore glasses or laboratory coats or appeared in front of chalkboards in a conflation of "professor" with laboratory scientist[24]. The background of a chalkboard matches the emoji suggestion for professor made by iPhones running Apple's iOS 10 for an emoji of a White man standing in front of a chalkboard[25]. Men were shown as bedecked with grey or white hair that stuck out from the head in a hairstyle that has become associated with Dr. Albert Einstein[26, 27], who was a well-known and highly-regarded professor of physics. The visual images of "professor" tended to showcase individuals as rational and scientific, which has been an enduring perspective on the appearance of a professor since the late 1960s[24, 28, 29]. The embodiment of a professor that is normalized through these online image results is intertextual and upholds that a professor is expected to be White, male, and weight-proportionate[30]. Representations of professors within images influence students and their preconceived notions of whom to expect as authoritative and expert in the classroom, which lead to significant implications on student evaluations of teaching.

Another example of how image searches are biased and have real-life consequences is an online query for medical conditions related to skin. Those of us that have experienced bumps or dry patches on our skin might turn to the Internet for images to figure out what might be ailing us. Unfortunately, like other mass media representations[31], the images that result in online searches nearly always reinforce a dominance of White and male. In 2021, image examples of "bumps" or "hives" yield 100% pale skin as examples. When race and gender are rendered invisible in images online, the outcome may be classified as color-blind and gender-blind. Color- and gender-blindness, often under the guise of neutrality, maintain White racial and male gender domination by normalizing White men as the standard[13, 32, 33]. Pictures of diseases related to skin tend to be on white skin in medical textbooks, physical and online, which leads to the perpetuation of biases in health care, limitations on health diagnoses, and inequities in medical training related to allergies and diseases of the skin, by professionals and amateurs

alike[34, 35]. Omissions from these online images results become othered[36]: White men are legitimated as professors, and white skin is validated as the foundation for visible detection of skin conditions.

Algorithmic othering is happening. As algorithmic systems become commonplace, we should be represented in algorithmic results. Examples of biases along race and gender extend beyond search results. For example, facial recognition and covert surveillance technologies have been used by those in power to oppress communities of color to unjust outcomes affecting employment, prosecution, and more. I choose examples of representation online because representation continues to matter and because their results often go unquestioned by acritical search users that believe online searches yield neutral findings. An education in critical tech ethics would behoove the individuals that program and impact the creation of the algorithms that increasingly construct our online world and the individuals that casually and critically use and benefit from such algorithms.

5 Institutional Changes

A reason to promote critical tech ethics is to ensure that race and gender are prioritized within digital media ethics. Earlier in this article, I questioned how often tech ethics explicitly engages with racial equity. One domain that provides empirical data on how ethics might connect with race lies within the university system of the United States.

As part of my keynote for Mozilla in 2019[37], to gain better understanding about the primacy of race within undergraduate computer science education, I analyzed a public, online listing from 2018 of the names of crowdsourced courses identified as ethics related to technology[38]. As part of the listing, instructors could opt to share their syllabus. With syllabi as my units of analyses, I used curricula by faculty to analyze how ethics was defined by the individuals that were teaching self-identified courses in ethics. What does "ethics" mean in praxis, not in theory, when ethics is taught to undergraduate students? And how often does such education in ethics intersect with issues related to race? To focus on how race is construed in the context of an American computer science department, I audited when and how the topic of race was explicitly referenced by faculty that used English as the primary language in their education of ethics to undergraduate students in computer science in the United States.

Using thematic and critical discourse analyses on the results of the ten syllabi whose entire contents were available publicly online, from undergraduate ethics courses taught in computer science in the United States, eight syllabi did not list race explicitly as a topic of focus for any class of the entire school term, leaving only two syllabi that featured race specifically for a class session. While stating race at all makes the faculty that created those two syllabi exemplary, it was unfortunate that the topic of race was constructed to fill only a single class session, as opposed to having race in tech ethics as a regular part of an ongoing discussion across all class sessions. Each of the two syllabi construed "race" in two different contexts: one syllabus defined race in terms of improving the racial diversity of employees in the field of computer science[39]. Another syllabus identified race as a factor for influencing, and being influenced by, algorithmic data[40]. Outside of those two syllabi that included a class session on race, four syllabi included links to supplemental readings that were aligned with the latter definition of race, namely, algorithmic bias in terms of racist outcomes against the Black community[41−44]. One syllabus mentioned "algorithmic fairness" as a topic, but race was never introduced; instead, ethical considerations about algorithmic fairness were defined in terms of the extinction of humanity by robots and the attachment of emotions related to robots. In other words, the ethics of robotics was considered a priority by faculty, but the ethics of race was rendered irrelevant for this undergraduate course: robots appeared as an ethical issue in artificial intelligence on this syllabus, but race as an ethical issue related to artificial intelligence did not materialize in the syllabus for this course. I provide these results as a snapshot in time of how tech ethics is such a broad area that the topic of race may be rendered invisible.

As a topic for teaching, research, and discussion, race may be more uncomfortable, and therefore more challenging, for those that are untrained in critical race theory or for those whose lived experiences represent the institutionally-dominant White community in the United States. For the vast majority of undergraduate computer science classes taught about ethics, ethics is acritical and supportive of the status quo. While tech ethics might be heralded as a way to consider the social good[45], tech

ethics training tends not to engage explicitly with racial equity. In practice, across the training and education of civil society organizations, ethics tends to rely upon the work of heterosexual White cis male philosophers and does not address intersectional justice across races, genders, and sexualities.

Computer science ethics classes are often taught by computer science faculty that have minimal training in ethics, let alone any training in critical race theory. This lack of training is a systemic issue that reflects biases in what expertise is seen as valuable: computer science ethics is taught by technical scholars who have self-studied some ethics, rather than people with deep expertise in ethics and race. As I have advocated in my public scholarship[7, 37], universities supportive of critical tech ethics should seek to hire faculty with training in and whose scholarship promotes critical race theory, intersectional feminist theory, or critical race feminist theory connected to ethics related to technologies.

6 Critical Tech Ethics

Ethics without intentional criticality results in a panacea for people with the power to influence computer science, digital systems, and artificial intelligence. Ethics devoid of critical race training is incomplete and deleterious. I am concerned about a responsibility gap between decisions made by people designing algorithms and people experiencing algorithmic biases. I position accountability for racial fairness upon existing business, educational, and civil society institutions that train and hire individuals and upon established organizations that design and manage algorithms. A way to guide better interactions between artificial intelligence and diverse humans is to provide improved academic and social instruction related to racial equity to creators and users of technologies for academic communities, technology organizations, and civil society actors. Rather than present ethics as race-neutral, reflecting a philosophy of color-blindness[10], I seek to institutionalize considerations of racial equity through the establishment of critical tech ethics.

Technology is not neutral. Algorithms have embedded values. The question then is whose truth is reflected and whose truth is omitted in the design and use of algorithms. Algorithmic bias happens because values are implicit within the programming and design of the algorithms for online behavior[46–48]. Algorithms fit with and help advance a single race as the dominant culture in the United States[48]. Critical tech ethics makes explicit the implicit ways that Whiteness is hegemonic to the detriment of other races. Critical tech ethics is based on critical race training that offers both intellectual and political responses to challenge racial power and change American society. I encourage readers to engage in digital acts of racial realism, as described by Bell Jr[49] to "challenge principles of racial equality" and to use "social mechanisms" to "have voice and outrage heard".

Critical tech ethics is an area of study and application that includes:

(1) **Institutionalizing critical tech ethics through mandating racially-aware standards for reviewing research, awards, grants, and funding**: Specifically, I seek to construct "racial implications of this proposal" into a critical tech ethics standard for civil society organizations because downstream uses of artificial intelligence should be part of the intellectual rigor that is valued for judging work in reviews[8]. In doing so, organizations and companies that mandate considerations of racial implications in their applications signal that racial awareness is a significant factor in awarding funding and awards, which, in turn, encourages participants to reflect upon how their work is impacted by and imbricated with race, racism, and racial equity.

(2) **Setting expectations for teaching critical tech ethics centered on racial equity**: Required training in critical race theory would help those creating our technological worlds to understand better about ethical considerations related to race. Specifically, such education should be informed by critical race theory to change norms and demonstrate how computer science, digital systems, and artificial intelligence have played a role in the episteme and techne of racism[8]. In doing so, critical tech ethics actively builds in discussions of race, racism, and racial justice to minimize the reproduction and hegemony of Whiteness by those in programming, coding, computer science, engineering, and open source communities.

(3) **Establishing critical tech ethics practices for improving industry norms aligned with the goal of improving racial justice**: Due to the influence of capitalism upon choices made by students for profitable

careers and choices made by universities to supply employees for in-demand occupational niches, industry must also be part of the equation to establish critical race thinking as part of everyday computer science education in the United States. To encourage institutions to mandate the addition of critical tech ethics, employers will need to update the requirement section of their job ads to state the desirability of hiring individuals with training in considering the racial implications of artificial intelligence[7, 8, 10]. In doing so, technology corporations may take a step towards contributing towards racial justice, which involves tactics, actions, and attitudes that challenge racial power, resulting in more equitable opportunities and outcomes[50].

7 Conclusion

Included within this article is a call for action to influencers, leaders, and policymakers to take note to help move our society towards greater justice for everyone, particularly communities of color. To combat racism and sexism[51, 52], changes to existing curricula must occur. Students themselves acknowledge that critical race thinking should be taught more frequently than they are available currently[53]. Across leading institutions globally, a lack of inclusion of race, gender, intersectionality, and power leads to an enactment of ethics education lacking in justice. For too long, the rhetoric of diversity has been unaccompanied by institutional change. We must recognize and address that computer science departments in the United States have overlooked how the technologies on which they are training future programmers are impacted by and imbricated with race, gender, sexuality, religion, and other axes of identity. Presumptions about the neutrality of algorithms have resulted in the biases we see today in the inputs and outputs of various technologies[46−48]. Countering those biases through critical tech ethics will be helpful in reducing unfair and unjust outcomes based on algorithms. Rendering diversity in race and gender as visible is a process that will take greater commitment by those producing the algorithms and those using the algorithms because online data are a social enterprise[23]. Critical tech ethics has been developed with the imperative to help improve society through connecting race to ethics related to technology, so that we may reduce the propagation of racial injustices currently occurring by educational institutions, technology corporations, and civil actors. We should live in a world in which the responsibilities for racial equity do not fall on people of color only, but are borne by everyone that influences and is influenced by algorithms. My project is to improve racial equity through the development of critical tech ethics as research, teaching, and practice in social norms, higher education, policy making, and civil society.

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