Announcing EquitableTech: Open Source Skills Training of Minority Students

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Abstract—Our 2018 STCBP RESPECT Lightning Talk is announcing a new diversity initiative – EquitableTech – for open source skills training of Black and Latino computer science students. With seed funding from a Kapor Center GRIT grant, we are planning one-day introductory workshops about open source software (OSS) modeled after the OpenHatch college campus program. However, our workshops will target minority serving institutions to encourage OSS diversity. Furthermore, we will conduct a survey of minority computer science students to assess knowledge of and interest in OSS. As an introduction, this paper briefly reviews the news reports and the scant empirical literature about OSS diversity.

I. INTRODUCTION

The meme "GitHub is the new resume" describes a modern expectation for competitiveness in information technology coding jobs [1] where GitHub serves as a repository for Open Source Software (OSS) projects. A majority of tech companies in a recent OSS survey now use such programmer communities as recruiting networks [2] since OSS and its practices have permeated commercial organizations [3]. However, higher education computer science departments have largely failed to adapt their curriculum to include OSS principles and skills [4] since academic instruction generally changes much more slowly than private sector developments especially in the fast-moving tech industry. Thus, undergraduate computer science students and other self-taught tech enthusiasts are generally on their own for learning about OSS.

A student may not have the time or resources to learn and to practice a new skill outside of their curriculum. Contributing to an OSS project is similar to a student participating in an unpaid internship. Marginalized peoples such as African-Americans, Blacks, Hispanics, Latinos, and Native Americans may not have the luxury of volunteering for an OSS project. Thus, such unpaid labor may represent a significant barrier to the entrance and retention of minorities in a tech career. The few demographic surveys [5, 6] about OSS communities show a low participation of women and minorities. This alludes to both the entry barriers into OSS projects as well as the chilly climate that affects retention.

There is very little empirical, peer-reviewed research on the social science of OSS communities that address the perspectives of underrepresented peoples though a call-to-action has been made [7]. Two studies analyze OSS communities from the perspective of gender [8] and age [9]. We have not found any empirical literature specifically about people of color in OSS. However, it is well known that the U.S.A. will become a minority-majority nation by the 2040s largely driven by the growth of the Latino community [10]. Thus, our work addresses a significant gap in the research knowledge base necessary for establishing an inclusive tech ecosystem – namely, what are the experiences of minorities in OSS and what intervention can improve their situation?

We suspect that the problems minorities face in OSS relate to the common issues surrounding unpaid internships in general [11] such as in the entertainment and media industries. In the STEM disciplines, more is known from the literature about undergraduates and their involvement in training experiences [12]. Such best practices and academic knowledge has been reviewed at the federal level [13]. However, OSS experiences have unique challenges that have been documented not in the peer-reviewed literature but through blog articles and testimonials by practitioners [14-18]. OSS "work" does not occur in a typical workplace environment. Namely, an OSS "contributor" works remotely and isolated from other project members perhaps with volunteer

"supervisors" (e.g. moderating code review, answering questions) under poor usability practices. There are no clear on-boarding steps for potential new members so they must navigate an opaque process for finding projects, documentation, pending tasks, communication channels, and mentors. Finally, the project itself may not be structured with typical workplace institutional governance and employer policies. The distributed nature of the "team" combined with such a vague "community" can lead to a hostile environment since there is little accountability [e.g. 19]. This challenging situation warrants an intervention that we describe below. We begin by describing relevant prior work.

II. INTERVENTION
A. Prior Work

The state of OSS diversity initiatives was reviewed recently [20]. Efforts include diversifying OSS conferences as well as paying students during their first OSS experience as a traditional mentored internship. The latter effort called Outreachy is modeled after the Google Summer of Code opportunity but with a diversity mission with respect to the participants (initially a women-specific program) [21]. An initiative not described in the review is OpenHatch whose non-profit organizes educational workshops on college campuses to teach OSS skills [22].

We have been developing a tech diversity project (called EquitableTech) to complement our existing doctoral-level initiative called MinorityPostdoc.org. This latter work diversifies the academic professoriate by sourcing PhD-level talent through our Doctoral Directory recruiting database. EquitableTech in part will replicate this process by creating a bachelors-level tech/coder recruiting database. Our exploration into the open source community brought us to the Open Source Bridge conference where we met administrators with the Outreachy and OpenHatch projects. A collaboration resulted between us and Outreachy/OpenHatch to help those projects find people of color to participate in their opportunities. Thus, we organized a professional development panel about open source that occurred at the Richard Tapia Celebration of Diversity in Computing conference [23]. We have also been advocating for OSS diversity at conferences including All Things Open, TechInclusion, the National Center for Women & Information Technology, and the Society for Advancement of Chicanos & Native Americans in Science. Importantly, our sponsorship of and networking at these events has led to the accumulation of over 1,000 resumes that will form the content of a future EquitableTech talent database. However, there is a need to systematically collect demographic and other information from these minority coders and computer science students through a survey study.

The final relevant background information is that the non-profit OpenHatch organization has closed [24]. During 5 years of coordinating almost 50 "Open Source Comes to Campus" workshops, around 1,000 students were introduced to their 1-day curriculum. Around 25 universities and colleges were host sites though only a couple were minority-serving institutions.

B. Educating minority coders

Our first intervention is to conduct two pilot workshops modeled after OpenHatch but at a Historically Black College and University and a Hispanic-Serving Institution. We plan for around 30 student attendees based upon the OpenHatch experience using their interactive curriculum for optimal student-to-facilitator ratio. We will rely upon the OpenHatch open access training materials and their extensive national network to solicit experienced open source community members to help as volunteer teaching assistants. Future funding will allow expansion of the workshops to more schools including Tribal Colleges.

C. Surveying minority coders

The current EquitableTech talent pool will serve as the target audience for a needs assessment survey of minority computer science students and coders. We will determine OSS familiarity and interest in or barriers to participation as OSS code contributors. Soliciting survey responses from our various talent pool sources will standardize demographic information such as personal cultural characteristics, educational background, and coding skills.

Other important objectives will be achieved through this survey. First, updated resumes will be collected to have more complete education and career information for future studies. Second, the survey publicity campaign within our EquitableTech contact list will be used to publicize future OSS training workshops beyond the pilot sites mentioned above. Third, a long-term goal of the EquitableTech survey dataset is to have a talent pool for longitudinal monitoring to identify minority coders who would be interested in pursuing graduate education either as K12 instructors or doctoral-level faculty careers. We worry that lucrative tech industry salaries are drawing minority coders away from considering teaching careers that do not pay as well. The current generation of Baby Boomer minority teachers and faculty are retiring. Thus, we may have a drastic gap in the pipeline of ethnic role models and advocates as K12 STEM instructors and higher education faculty necessary for serving the U.S.A.'s growing minority student population.

ACKNOWLEDGMENT

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