

# Community Advisory Boards (CAB) for University Research on Technology Impacts Among Black Users

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## Abstract

For numerous years, people of color have faced the disproportionate impact of research, with Black communities bearing the brunt of exclusion, mistreatment, and exploitation, resulting in a profound distrust and resistance among the Black community towards participating in research opportunities. In the realm of Machine Learning (ML), the advent and implementation of automated speech recognition (ASR) systems have sparked transformative breakthroughs across various domains, including human-computer interaction, machine learning, natural language processing (NLP), and linguistics. Yet, as we embrace the potential of these cutting-edge systems, it becomes apparent that they can inadvertently perpetuate biases, posing significant challenges for marginalized linguistic communities, such as African-American English (AAE) speakers. To achieve a more just and inclusive technological landscape, it becomes imperative to confront and redress these biases, paving the way for ASR systems that truly embrace diversity and empower all voices. To address this pressing issue, we have taken the initiative to establish the Black Community Accountability Board (B-CAB), a community-based coalition comprising external non-profit organizations and civic leaders in the Pacific Northwest, United States, dedicated to serving Black/African American people. The primary objective of B-CAB is to foster enduring partnerships with local Black organizations, enabling collaborative efforts to design technology solutions that positively transform historically marginalized communities. Additionally, the B-CAB will embark on a collaborative research project that focuses on designing a virtual AI assistant prototype that is inclusive and representative of Black American English speech. By embracing community-driven research practices and equitable engagement, the B-CAB initiative aims to rectify the historical imbalances in research outcomes, building a foundation of trust and inclusivity, and inspiring the Black community's active participation in shaping technology solutions that uplift and empower their voices, aspirations, and futures.

## **Introduction**

In our rapidly evolving technological landscape, smart technologies featuring ASR capabilities have become an integral part of our daily lives. These advancements have the potential to transform the way we interact with digital systems. However, they also bring to light a significant challenge: the failure of ASR systems to recognize AAE. This inadequacy in ASR technology not only results in negative user experiences but also perpetuates existing disparities that disproportionately affect marginalized communities.

The critical need for cultural diversity in technology design and the urgency of increasing accountability and community participation in the design process have never been clearer. It is against this backdrop that our research endeavors to address these pressing issues by introducing the concept of a Black Community Advisory Board (B-CAB). The central objective of our research is to explore the possibilities of academic institutions partnering with community organizations to empower communities in shaping technology for more equitable outcomes. Through the establishment of the B-CAB, we aim to empower Seattle's African-American community to take the lead in ensuring equity, inclusion, and accountability in technological innovations that profoundly impact their lives.

## **Methods**

### **Scoping Literature Review**

Our research journey begins with an extensive exploration of scholarly literature, which highlights the critical importance of involving Black individuals, organizations, and communities in technology research and design. This literature review serves as the foundational framework for our research, highlighting not only the extent of the challenges but also the immense potential that arises when diverse voices are brought into the fold of technology design.

### **Community-based Participatory Research**

At the heart of our research methodology lies the principle of Community-based Participatory Research (CBPR). This approach entails active collaboration with Black individuals, organizations, and communities through the establishment of community-based boards, open dialogues, and co-creation sessions. Embracing this inclusive and collaborative methodology allows us to gain invaluable insights from their unique perspectives and lived experiences. Moreover, our steadfast commitment to accountability and real-world impact ensures that our research contributes to tangible improvements.

Our approach also places a strong emphasis on maintaining an ongoing dialogue with stakeholders and implementing feedback loops. This iterative process is vital in ensuring that our collective efforts result in meaningful and positive change. By prioritizing accountability in technology research, we aim to bridge the gap between theory and real-world impact.

## **Results**

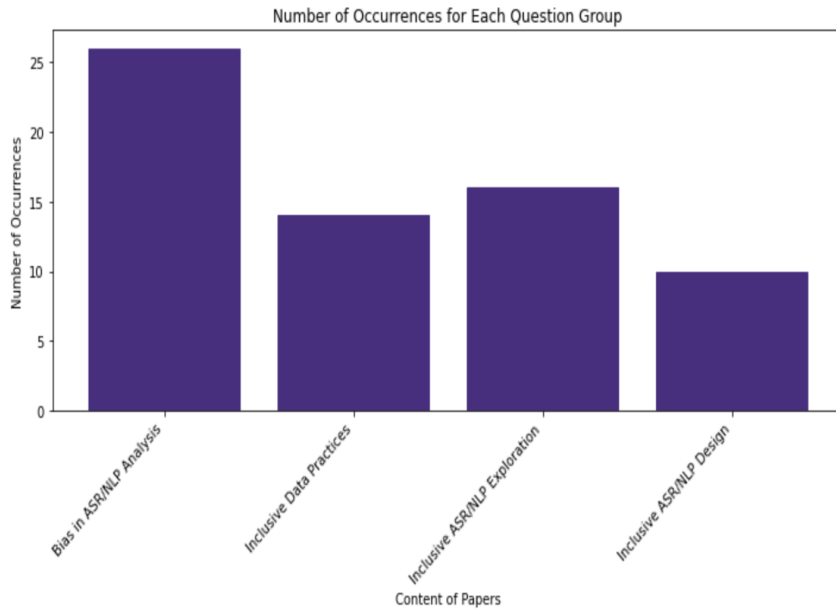
Our research endeavors have yielded a comprehensive understanding of the challenges and opportunities in the field of ASR technology for Black AAE users. Our exploration has traversed various themes within our findings:

**1. Bias Identification in ASR for Black AAE Speakers:** We delved deeply into the critical issue of bias identification in ASR, utilizing metrics such as Word Error Rate (WER). Our research also delved into the impact of non-severe bias on inclusion and equitable access to technology.

**2. Inclusive ASR/NLP Design Strategies:** Our research has provided valuable insights into best practices, approaches, and considerations for designing inclusive ASR and Natural Language Processing (NLP) systems. We underscore the significance of incorporating diverse linguistic and cultural representations into user interfaces.

**3. Inclusive Approaches, Methods, and Theories:** Our research has explored a spectrum of research methods, encompassing both quantitative and qualitative approaches, along with the utilization of theoretical frameworks such as critical race theory and decolonization. Additionally, we have embraced participatory approaches, including community-based research, to promote inclusivity in ASR/NLP design.

**4. Practical Recommendations for Inclusive Design:** Building on our research findings, we have meticulously outlined practical strategies, processes, and practices for designing ASR/NLP systems that embrace diverse linguistic and cultural patterns. Our aim is to create technology that authentically reflects the richness of our society.



This chart presents the findings from our literature review. Among the 76 papers we analyzed, 26 acknowledged the presence of bias in speech recognition. However, the number of papers providing solutions to address this bias is limited, with only 10 papers offering such solutions. One of the findings we found was the introduction of community advisory boards to help with building a more inclusive ASR. The second highest category involves inclusive exploration, where researchers have examined various aspects but haven't implemented specific solutions. The third highest category focuses on methods to make datasets more inclusive.

## Continuing Work

The establishment of the Black Community Advisory Board (B-CAB) stands as a significant milestone in our ongoing research. The B-CAB operates as a community-based coalition, comprising non-profit organizations and civic leaders in Seattle, Washington, all dedicated to serving the Black/African American community. This advisory board serves several pivotal functions:

- 1. Elevation of Black Voices:** Through the B-CAB, we provide a platform for amplifying marginalized narratives, perspectives, and experiences. This platform fosters an inclusive environment where diverse voices actively contribute to shaping a more equitable future.
- 2. Understanding Technology's Impact:** Our work within the B-CAB entails engaging in conversations that delve into the intricate impact of technology on Black lives and communities. This initiative positions the Black community at the forefront of technological discourse, ensuring that their voices are not only heard but also acknowledged.

**3. Feedback on Research:** The B-CAB plays a crucial role as a valuable source of feedback on our research initiatives. This ongoing dialogue between the academic community and the Black community enhances both the quality and relevance of our research, aligning it closely with real-world needs.

**4. Technical Competency:** The B-CAB is dedicated to facilitating educational opportunities and skill-building initiatives for Black community leaders. These initiatives equip them with the tools and knowledge necessary to navigate and leverage technology effectively, thereby empowering the community.

In addition to our ongoing collaboration with the B-CAB, we are excited to embark on our next project: the co-design of a virtual AI assistant for mobile banking applications. This project will follow a comprehensive developmental roadmap, ensuring that the technology is not only inclusive but also tailored to the specific needs of the Black community.

Prior to diving into the prototype's construction, we will employ Wizard-of-Oz tools to simulate user interactions. This preliminary phase allows us to fine-tune the assistant's functionality and identify potential gaps or errors in its responses. Furthermore, we will meticulously define the core capabilities and use-case scenarios of our assistant, providing a robust foundation for its functionality and guiding subsequent development. Additionally, we will design flowchart interfaces that map out branching paths within conversations, ensuring a seamless and user-friendly experience.

## **Conclusion**

Our research looked into the critical importance of addressing underrepresentation in technology by promoting culturally sensitive capabilities and actively involving diverse communities in the design process. The establishment of the Black Community Advisory Board (B-CAB) serves as a testament to the power of community-driven collaboration. Our research team is implementing innovative methods for organizing CABs to mitigate technology disparities and foster local partnerships.

As we look into the future, and our ongoing work, in collaboration with the B-CAB, we hope to empower, education, and transformative change within the Black community. The B-CAB epitomizes the essence of fostering an environment where inclusivity thrives. By valuing linguistic diversity and embracing AAE, we can build technologies that resonate with a wider range of users and authentically reflect the richness of our society. In doing so, we contribute to a future where technology becomes a powerful tool for equity, inclusion, and positive change, benefiting all members of our diverse society.

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