Joshua Pulsipher | Diversity Statement

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Overview

As a professor and researcher in STEM, I will continue my active role in supporting/leading initiatives to enhance diversity, equity, and inclusion (DEI) by perpetuating my ongoing efforts. When diverse voices are allowed to flourish, the caliber of research and teaching is lifted; however, a recent NSF study found that **women, Blacks, and Hispanics remain appreciably underrepresented** in earning STEM degrees because of systemic barriers (e.g., implicit bias and a lack of a sense of belonging). My vision is to establish an **inclusive environment** in the classroom, laboratory, and beyond to combat these obstacles such that all individuals feel their voice and experience are valued and that they can **flourish academically/personally/professionally**. Below I highlight two avenues I will continue pursuing to achieve this vision: (1) promoting and developing tools/resources that make challenging technical areas (in classroom and research settings) **equitably accessible** and (2) making new connections (academic networking with individuals and institutions) to **bridge gaps** in diversity. These pursuits are exemplified by my advocacy for **individuals with disabilities**, my open-source software solutions for **accessible research**, and my involvement in the **Latinx community**.

Promoting and Facilitating Accessibility

It is critical that we ensure individuals (in these groups and others) have access to and are aware of the resources/programs they need to succeed and feel supported. In my own lived experience with physical **disabilities**, I have learned through painful experience what a difference having and being aware of **equitable accommodations** makes in alleviating pain and disparity in already strenuous course work. Hence, in my teaching and research endeavors I have ensured my students are familiar with and take full advantage of the resources/programs (e.g., disability resource centers, identity centers, etc.) available. Moreover, I am committed to provide additional accommodations for individuals whose needs are not met with existing programs. I hold that such steps are essential for creating an inclusive environment where the needs of each person is equitably met to the greatest extent possible, as discussed in my teaching and research statements. I will continue to serve as an advocate for students/researchers being provided with appropriate accommodations to promote a learning and research environment that is readily **accessible and supportive**.

Furthermore, I endeavor to provide **accessible research advancements** to individuals with diverse expertise/backgrounds via the software-accelerated research paradigm discussed in my research statement. **Cutting-edge discoveries** in decision-making under uncertainty and data-science are typically highly technical in nature and are very difficult to implement without highly specialized expert knowledge. This makes many research findings difficult to reproduce which is a stumbling block to collaborative research. To combat these challenges, I use my software development skill-set to create **open-source tools** with intuitive interfaces that are usable for general engineers and scientists. For instance, using my software framework, `InfiniteOpt.jl`, I was able to rapidly train undergraduate chemical engineering students on how to model and solve highly sophisticated stochastic model predictive control problems which typically require rigorous formal training to implement and understand. As a professor, I will continue developing **accessible software tools** that use the cutting-edge techniques developed in my research group. I also will support initiatives (e.g., software development short courses) that help other researchers develop similar tools.

Building Bridges to Provide Opportunities to Enrich Diversity and Inclusion

I seek to develop relationships and opportunities that **bridge across historical divisions** among groups at the individual and institutional levels. Establishing new channels fosters collaboration, **mutual understanding**, and provide opportunities for **equitable inclusion** of underrepresented groups, elevating the caliber of learning/research for all.

One area of my focus is on **severely underrepresented Latinx communities**. Building on my Cuban heritage, years of community service in Hispanic organizations (e.g., a 2 year mission in Peru), and fluency in Spanish, I am strong advocate for the inclusion of the Latinx community in STEM. For instance, although there now exist healthy connections between my research community in process systems engineering and institutions in several Latin American countries like Mexico, Colombia, Chile, and Argentina, there are no professional ties to other countries such as Peru and Bolivia. Thus, I am leveraging my personal connections in Peru to establish professional ties with **Peruvian institutions** and foster interplay between our research/teaching efforts. This includes developing an undergraduate research program for

students from these universities to conduct research at CMU under the direction of faculty mentors and **expand their professional network**. I'm also organizing a short course series (in Spanish) with an emphasis on advanced scientific computing that I'll offer at several of these institutions in 2023. I intend to personally continue this initiative in building and strengthening relationships with professors, researchers, and students across the U.S. and Latin America, particularly among severely underrepresented groups (e.g., Peru). To this end, I am a member of the organizing committee that is reestablishing the **Pan-American Advanced Studies Institute** on Process Systems Engineering which will allow students from across the Americas to form meaningful connections and provide a platform for them to lead DEI initiatives that strengthen will our community.