

Undergraduate Thesis Prospectus

A Web Application for Instructors to Create Maximally Diverse Student Groups
Utilizing Integer Linear Programming and Modern Web Frameworks
(technical research project in Computer Science)

Advocates and Media Giants: Representation in the U.S. Film and Television
Industry
(sociotechnical research project)

by

Cal Hartzell

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Cal Hartzell

Technical advisor: Briana Morrison, Department of Computer Science

STS advisor: Peter Norton, Department of Engineering and Society

General Research Problem

How can social equity in the U.S. be improved?

Pervasive social group inequities in the United States can be documented in numerous ways. For example, black drivers are about 40 percent more likely to be subject to a traffic stop and about twice as likely to be searched, though searches of black drivers are 10 to 20 percent less likely to yield evidence (Pierson et al., 2020). The criminal justice system disproportionately incarcerates black adults, who are about 50 percent more likely than white adults to face lifetime incarceration for equal crimes (Tsai et al., 2022). Members of marginalized genders and sexualities report obstacles accessing healthcare. About 20 percent of LGBTQ people report refusal of care; about 30 percent report harassment in a medical setting (Grant et al., 2010). Such inequities warrant remedial efforts.

A Web Application for Instructors to Create Maximally Diverse Student Groups Utilizing Integer Linear Programming and Modern Web Frameworks

How can a web application enable instructors to create maximally diverse student groups?

Within higher education, it has been repeatedly shown that increased student exposure to diversity and group-based learning better student outcomes, namely increasing student social, academic, cognitive, and psychological growth, including fostering student identity development, intellectual engagement, leadership skills, psychological well-being, critical thinking skills, cooperation ability, self-esteem, and classroom results (Gurin et al., 2002; Bowman, 2013; Hilborn, 1994; Laal & Ghodsi, 2012). All common methods of group selection significantly limit diversity, with random assignment and self-selection almost always resulting in low diversity and instructor assignment requiring significant instructor time and effort to yield diverse groups (Bacon et al., 2001). Despite this, the most popular and effective instructor tool for automatic diverse group creation, CATME's Team-Maker, is difficult for instructors to access due to its high cost and implements an inefficient and non-optimal hill-climbing algorithm for group selection (CATME, 2022; Ricco et al., 2010).

The technical research project proposes a new web application enabling instructors to

effectively create maximally diverse student groups. Professor Briana Morrison from the Computer Science Department is advising this independent project. I'm partially collaborating with fellow UVA students Wenxi Huang and Ethan Steere regarding the topic, but I am perusing this project individually. The application utilizes modern web frameworks, namely Django and Bootstrap, enabling significantly cheaper development, hosting, and maintenance costs when compared to existing tools. Integer linear programming is also implemented for group selection, enabling quicker and more diverse group selection compared to existing tools. If the proposed new web application were effectively implemented at scale, instructor access to effective and efficient tools for the automatic creation of diverse student groups would expand greatly, enabling instructors to significantly and easily better student outcomes overall by implementing group-based learning with maximally diverse groups.

Advocates and Media Giants: Representation in the U.S. Film and Television Industry

In the U.S. since 2010 how have diversity advocates within the film and television industry increased representation?

Marginalized groups have struggled with representation and inclusion in the U.S. film and television industry since its beginnings in Hollywood. While in the past marginalized groups were almost completely excluded, e.g. in the 1910s-1950s African-Americans were forced to independently conduct production and distribution outside of the traditional industry, inequality is deeply rooted and remains prevalent (Erigha, 2018). While representation of marginalized groups in the film and television industry has improved greatly in recent years, marginalized groups are still greatly underrepresented on screen and off. In film, however, onscreen underrepresentation is substantial only among some historically marginalized groups. Latinos, for example, who constitute about 19 percent of the general U.S. population, account for only about 7 percent of film leads. In television, onscreen representation is poorer. Though racial minorities constitute about 43 percent of the general population, they account for only 27 percent of broadcast scripted leads. In both film and television, offscreen representation of marginalized groups is deficient. Though about half the general population is female, only about 22 percent of

film directors are women. Members of racial minority groups account for just 33 percent of digital scripted writers (Hunt & Ramón, 2022).

Researchers increasingly investigate industry representation and diversity. Molina-Guzmán (2016) contends that preponderant attention to onscreen representation has diverted attention from deficient offscreen representation and the institutional power that perpetuates it. She notes that pay-by-subscriber streaming services have promoted onscreen representation, particularly among Latinas / Latinos, but with no comparable offscreen effect. Karniouchina et al. (2022) conclude that institutional biases favor nonminority film directors in project assignment, budgeting, and distribution, even though minority directors generally achieve similar revenues on lower budgets. Kuppuswamy and Younkin (2020) argue that deficient onscreen film representation cannot be attributed to viewer preference, because films with minority casts have been no less profitable. Inclusive storytelling is essential to overcoming legacies of marginalization, especially among children. Block et al. (2022) read stereotypical and counter-stereotypical vignettes to children. They found that the stories influenced the children's gender stereotypes.

Participants include studios, producers, distributors, and the trade associations that represent them; organized professional actors, social equity advocacies, and some viewers. Netflix, which produces and distributes streaming movies and television, commissions inclusion studies, established a \$100 million creative equity fund, and collaborates with organizations that promote representation in the industry. A Netflix co-CEO claims: "The Netflix Fund for Creative Equity will invest in the next generation of underrepresented storytellers" (Sarandos, 2021). The Writers Guild of America Committee of Black Writers stands for equity in employment and for the interests of its members, publicizes deficient black writer representation and aids black writers within the industry. The committee asserts that its members are "willing to do [their] part to continue to bring diverse, dynamic, and authentic storytelling to the rest of the world" (Amor et al., 2020). The Motion Picture Association (MPA), made up of the major U.S. film studios and Netflix, partners with organizations improving representation in the industry and hosts events

highlighting the importance of representation. According to MPA public relations (2022), the association is “working hard with our member studios to collectively address diversity, gender parity, authentic cultural representation, and pipeline recruitment opportunities from underrepresented communities in our industry.” GLAAD, a nonprofit LGBTQ media advocacy standing for equitable values and for the interests of the LGBTQ, publicizes U.S. LGBTQ film and television representation reports (Deerwater, 2021; Deerwater, 2022), and “works with Hollywood to shape transgender stories and help cast [transgender] actors” (GLAAD, 2022). Increasingly active and influential participants include unorganized and semi-organized viewers. Primarily through social media, they demand better representation and urge others to support inclusive film and television projects. Following the release of the trailer for *The Little Mermaid*, starring black actress Halle Bailey, many black viewers posted on social media to show their children’s favorable responses. Many urged others to support the film by seeing it in theaters. In a tweet about her daughter, Candace (2022) reported that the trailer “brought her so much joy.” An accompanying video proved her claim. Clarke (2022) posted: “The Black community needs to show up for this movie exactly the way we did for Black Panther.”

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