

Undergraduate Thesis Prospectus

A Systems Approach to Improving the Spectator Experience at Collegiate Football Games
(technical research project in Systems Engineering)

A Slow Victory: How the Disability Community is Fighting for an Accessible Stadium
Experience
(sociotechnical research project)

by
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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.

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General Research Problem

How can the spectator experience be improved at sporting events for a diverse audience?

In the United States, sports are the center of social life and entertainment, demanding perfection in physical and digital experience. Physically, spectators need efficient gameday procedures and comfortable arena experiences; digitally, spectators expect seamless integration of technology into gameday. Sports “allow people from different walks of life to share bonding experiences,” yet consistently exclude people with disabilities (Swain, 2020). Improving fan experiences requires not only engineering talent to manage thousands of fans through carefully created systems, but a robust understanding of the fan base, promising a place for all fans in the stadium.

Improving Spectator Navigation of UVA Football Games

How can the spectator experience be improved at the University of Virginia's football games?

At the University of Virginia (UVA), the football program is in poor health and football fans in even poorer health, with the stadium only reaching 44% average capacity through the first two home games of the 2022 season (client data). In 2019, UVA's football program brought in \$32 million (Mavredes, 2019), which is used to fund scholarships, facilities, and salaries across all other athletic programs (Martin et al., 2019). With such great opportunities for financial gain, the UVA Athletic Department has interest in enhancing the gameday experience and boosting attendance.

Wakefield and Sloan (1995) determined the top concerns of fans when attending a game to be complicated parking, crowding when entering and navigating the stadium, cleanliness, inadequate space in walkways, and team loyalty. Thus, our capstone team, led by Robert Riggs

in the department of Systems Engineering, and consisting of myself, Abigail Freed, Alexandra Labus, Brendan Lynch, Joseph Mastrullo, and Julia Sharff, will adopt a top-down approach to holistically enhance the UVA football spectator experience.

The UVA Athletic Department has removed in-game marketing endeavors from our scope, tasking the team with logistics and traffic flow outside of and within the stadium. Our team has identified three problem areas for investigation based upon observations and encouraged by Wakefield and Sloan's (1995) research: vehicular and pedestrian traffic pre-game, stadium ingress, and pedestrian congestion in the stadium.

Charlottesville's transportation infrastructure struggles to maintain efficiency due to high volumes of fans entering the city on gameday. Infrastructure challenges, lack of police force, and an inadequate traffic plan prevent easy entrance to Scott Stadium, leaving fans frustrated. To address problem areas relative to traffic, the team will collaborate with UVA police to understand current traffic plans set in place for gameday and utilize Virginia Department of Transportation (VDOT) data to determine areas of congestion in the area. We will compare these plans and data to optimal high volume traffic plans found in the published literature. The secondary objective is to enhance spectator education for parking lot navigation. The deliverables will be a list of improvements, used by UVA police to create a new traffic plan, and a spectator education plan for parking. With a new traffic plan in place and a more informed fanbase, congestion will decrease.

With about 36% of ticket scans occurring after kickoff through UVA's first two home games in 2022, gate congestion is hindering fan energy at the start of the game. In regards to stadium ingress, we will conduct analysis on ticket scan data provided by the ticketing system. Goals of this analysis include creation of a heatmap to detect gate congestion and trend analysis

to understand spectator behavior. The deliverable will be an optimization plan for each gate, which will help the UVA Athletic Department account for differences in fan volumes scanning in at each gate, decreasing wait times for spectators.

The presence of non-permanent vendors in Scott Stadium impedes foot traffic, leading to congestion throughout the concourse. Stadium congestion will be assessed using observational data. We will use maps of vendor arrangement to observe how changes in vendor orientation impact pedestrian flow within the stadium. The deliverable will be a map of optimal placement for each vendor type, which will allow patrons to navigate the stadium without heavy traffic or consistent obstacles.

A Slow Victory: How the Disability Community is Fighting for an Accessible Stadium Experience

How have people with disabilities and their allies advocated for an accessible physical and digital stadium experience at sporting events in the United States?

In the 1980s, there was a call to action for the USA to pass civil rights legislation for people with disabilities, seen most evidently by the National Council on Disability's (NCD) 1986 report, which called for a comprehensive law used to "improve the ability of persons with disabilities to live with dignity and as independently as possible within their communities (NCD, 1986)." The NCD created the discrimination diaries, documenting the conditions people with disabilities faced before passage of the Americans with Disabilities Act (ADA), and motivating presidential candidate George H.W. Bush to promise passage of a civil rights law for people with disabilities if elected. Within his first year in office, Bush worked with Congress to pass the ADA in July of 1990, which paralleled the Civil Rights Act of 1964 in terms of protections and

change for its intended audience (ACL, 2020). With more than 11,000 lawsuits filed in 2021 on the basis of Title III of the ADA, which requires accessibility standards to be met in places of public accommodation, people with disabilities and their allies are still advocating for accessible experiences, 32 years after the passage of the ADA. (Vu, Launey, & Ryan, 2022; ADA, 1990). Sporting arenas are no exception to this statistic, often violating the ADA, prompting groups to organize and advocate for equal opportunity.

Published research about accessibility in the USA takes the form of court reviews and ADA investigation. A recent decision in *Childress v. Fox Associates, LLC* redefined “meaningful access,” as required by ADA. Courts have traditionally held a minimal standard to provide “meaningful access;” with the *Childress* decision, “meaningful access” was redefined to require equal opportunity for people with disabilities to receive the same benefit. The *Childress* court added a caveat to their decision: if the requests brought to Fox Theaters “resulted in undue burden,” they could bring their own claim to adjust the ruling. The greater standard for “meaningful access” has made it more likely the defendant will face “undue burden,” resulting in a lack of accommodation (Stout, 2021). Interpretation of the ADA’s requirements has been named as a key challenge; as “meaningful access” is a constantly evolving standard, a clear definition will be critical in ensuring accessibility standards are met (Kovacs Burns & Gordon, 2009). Further investigation of the above research problem will focus heavily on the role of litigation in making sporting arenas more accessible to the approximately 40 to 57 million people living with disabilities in the US (Brucker & Houtenville, 2015).

Participant groups fall into two categories: those using litigation to achieve their goals and those promoting accessible design.

Disability Rights Advocates (DRA) is a group advocating for the rights of people with disabilities “through high-impact, precedent-setting litigation (Martinez, 2021).” DRA’s mission is to bring equitable access to mainstream life for people with disabilities (DRA, 2015). DRA’s involvement in the sporting realm includes a recent lawsuit filed against the San Jose Sharks for their role in making the San Jose Sharks + SAP Center mobile application, a core component of their digital stadium experience, inaccessible to those with vision impairments (*Salsiccia v. Sharks*, 2019). The National Association of the Deaf’s primary goal is to ensure “the collective interests of the American Deaf and hard of hearing community are seen and represented among our nation’s policy makers (NAD, 2022a).” Although litigation is not one of NAD’s top strategies for achieving its goals, they have filed several lawsuits against sporting venues, such as the Washington Commanders and the University of Maryland, for failure to provide captioning, thereby excluding the Deaf community (NAD, 2022b). Participant groups such as the DRA and NAD are using litigation as a tool in the fight against inaccessible public spaces, ensuring compliance with the ADA.

With litigation as a primary strategy for advocacy groups, there exist groups that support businesses in their fight against plaintiff lawsuits, such as Seyfarth Shaw LLP’s ADA Title III Team. Seyfarth’s goal is to provide litigation defense and counseling services to businesses “bombarded...by serial plaintiffs and disability rights advocates.” Seyfarth’s ADA Title III team recently protected an MLB team’s stadium renovation plans that were under scrutiny for accessibility compliance failures (Seyfarth Shaw LLP, 2022). Seyfarth’s team is committed to helping businesses avoid repercussions from failed or subpar compliance, using knowledge of plaintiffs’ litigation approaches as a strategy for success, although they have dispatched a

negative reputation through public reminders of their dedication to a “universal design mission statement (Shannon et al., 2018).”

KultureCity and Paralyzed Veterans of America are helping stadiums become accessible spaces for people with both “invisible” and physical disabilities, promoting accessible design to achieve their goals. KultureCity focuses on bringing inclusive, sensory-friendly experiences to people with sensory needs, “promoting the freedom for everyone to be included in all activities everywhere (KultureCity, 2020).” KultureCity’s partnership with Quicken Loans Arena has transformed the environment, allowing people with disabilities to have a comfortable experience when attending events; KultureCity has implemented employee sensory awareness training, a Quiet Space Sensory Room, provided sensory bags, and permitted re-entry to those with sensory needs at Quicken Loans Arena (Anzilotti, 2017; Clenadams, 2017). The Paralyzed Veterans of America (PVA) advocate for health care through routine site visits, spinal cord injury research and education, and civil rights advocacy regarding the ADA. PVA’s architect team worked with US Bank Stadium in 2018 to provide an “additional level of access for mobility restricted individuals” at the Super Bowl (PVA, 2021). Both KultureCity and PVA have used their niche expertise to partner with stadiums, paving the way for increased accessibility and comfort amongst people with disabilities engaging with sporting events.

References

ACL (2020). Administration for Community Living. (2020, July 27). ADA History - In Their Own Words.

ADA (1990). Americans With Disabilities Act of 1990, Pub. L. No. 101-336, 104 Stat. 328 (1990).

Anzilotti, E. (2017, November 10). Redesigning sports arenas to make them more accessible to fans with autism. *Fast Company*.

Brucker, D. L., & Houtenville, A. J. (2015). People with disabilities in the United States. *Archives of Physical Medicine and Rehabilitation*, 96(5), 771–774. Web of Science.

Clenadams. (2017, March 30). Quicken Loans Arena is first NBA Arena certified as sensory inclusive. *NBA.com*.

DRA (2015). Impact. *Disability Rights Advocates*. (2015, November 20).

Kovacs Burns, K., & Gordon, G. L. (2009). Analyzing the impact of disability legislation in Canada and the United States. *Journal of Disability Policy Studies*, 20(4), 205–218. Web of Science.

KultureCity. (2020, March 24). Learn. *KultureCity*.

Martin, S., Detert, J. R., & Bowers, K. (2019, November 5). UVA football: Fanning the flames for fans. *Darden Ideas to Action*.

Martinez, K. (2021). A Letter from Kathy Martinez, DRA President & CEO.

Mavredes, Martha S. (2019). University of Virginia Intercollegiate Athletics Programs for the Year Ended June 30, 2019.

NAD (2022a) About Us. *National Association of the Deaf*. (2022).

NAD (2022b). NAD files complaint against University of Maryland college park athletic programs. *National Association of the Deaf*. (2022).

PVA (2021). Paralyzed Veterans of America contribute to Vikings' Super Bowl Stadium Accessibility Redesign. *Paralyzed Veterans of America*. (2021, September 21).

Seyfarth Shaw LLP. (2022). ADA Title III & Public Access. *Seyfarth Shaw - ADA Title III & Public Access*.

Shannon, M., Hoffman, V., Fritz, K., & Gesinsky, L. (2018, October). Diversity, Inclusion and Compliance at Seyfarth Shaw. *Ability Magazine*. (Interview).

Swain, A. (2020, May 12). The importance of sports in American culture. *North Pointe Now*.

Wakefield, K. L., & Sloan, H. J. (1995). The effects of team loyalty and Selected Stadium factors on spectator attendance. *Journal of Sport Management*, 9(2), 153–172. SportDiscus.

NCD (1986). National Council on Disability. (1986, February 1). An Assessment of Federal Laws and Programs Affecting Persons with Disabilities- With Legislative Recommendations.

Salsiccia v. Sharks (2019). Salsiccia et al. v. Sharks Sports & Entertainment, LLC et al. (United States District Court Northern District of California San Jose Division March 26, 2019).

Stout, M. L. (2021). Meaningful Access: True Equality or Frightening Reality? *Missouri Law Review*, 86(2), 675–691. EBSCOhost.

Vu, M., Launey, K., & Ryan, S. (2022, July 12). 2022 ADA Title III Mid-Year Federal Lawsuit Filings Drop 22% Compared to 2021. *Seyfarth Shaw LLP*.