

**Modernizing Thru-Hiking: A Web Application Design to Connect the Appalachian Trail Community**

(Technical Paper)

**Technology and the Outdoors: An Analysis of Technology to Improve Outdoor Recreation**

(STS Paper)

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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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## **Introduction**

As society's reliance on digital connectivity increases, the controversy surrounding the presence of technology in the outdoors continues to grow. Traditionalist views highlight wilderness philosophical concerns that conflict with new generational ideas for technologically enhanced outdoor experiences (Selin et al., 2020). Issues related to environmental ethics and resource management have also risen from the increased use of smartphones in remote outdoor spaces (Kahn et al., 2009). Despite the controversy surrounding technology and digital connectivity, potential benefits persist related to safety, availability of information, resource management, and sustainability.

On February 19th, 2021 I began a long-distance hike (thru-hike) of the 2,193-mile Appalachian Trail, which stretches from Georgia to Maine. Throughout this journey, I relied heavily on my smartphone for GPS and digitalized maps. In addition, while preparing and planning for the hike I spent countless hours researching the trail and searching online for advice. My experience was not unique, as most hikers depend on the abundance of information related to the trail and safety provided by popular hiking apps such as Guthook's Guide (Rogers & Leung, 2021). Despite the abundance of information, resources, and how-to guides surrounding the Appalachian Trail lack diverse perspectives and inclusive guidance. This trend is not specific to the Appalachian Trail, rather it follows a national pattern of minority underrepresentation in outdoor recreation, specifically in national park visits (Winter et al., 2019). Therefore, my technical topic will be to design a web application for the Appalachian Trail that promotes diversity, education, and inclusion within the hiker community.

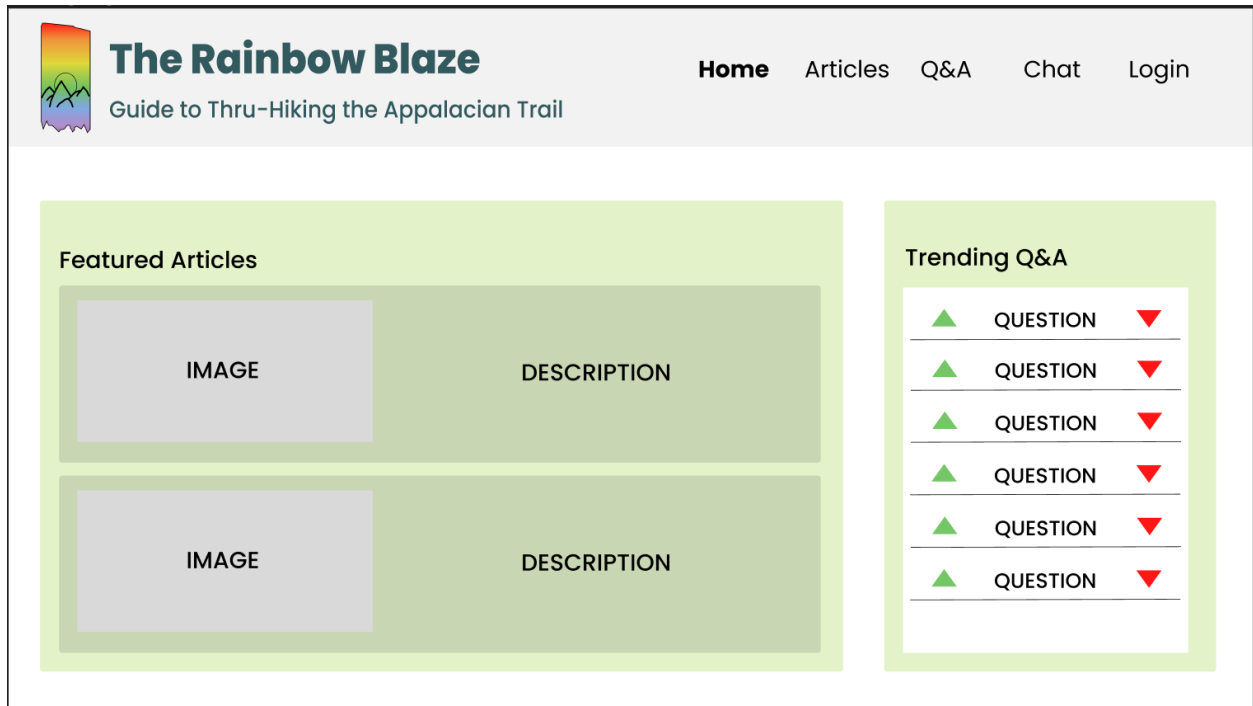
An additional dimension to the relationship between outdoor recreation and technology is the influence of digital connectivity. The nearly instant availability of vast amounts of

information provided by technologies like computers and smartphones has modernized the way people interact with the environment. Therefore, in my STS research, I will investigate how technology is changing outdoor recreation.

### **A Web Application Design to Connect the Appalachian Trail Community**

During the time spent on the Appalachian Trail, I observed first-hand the lack of diversity and inclusion in the outdoor community. One possible explanation for this trend is the lack of diversity among outdoor advocates and educators. Therefore, my capstone project will focus on a web application design to connect the larger Appalachian Trail community. Current resources surrounding the Appalachian Trail remain scattered across websites, word-of-mouth blogs, books, and podcasts. Without a consolidated source of information, this research process can appear endless and leave hikers feeling disheartened. In addition, due to the lack of diversity in the outdoor community, diverse resources on thru-hiking remain hard to find. My capstone web application aims to provide aspiring long-distance hikers access to all the information needed in one place, while also facilitating an inclusive digital community.

The proposed features for the web application include comprehensive how-to guides, chat rooms, and question forums. Key design components of the site include a “Home,” “Articles,” “Q&A” and “Chat” web page. The “Home” page and general site styling are displayed in Figure 1. The intended outcomes of this web application include making thru-hiking the Appalachian Trail more accessible to marginalized communities and increasing inclusion outdoors by providing supportive affinity spaces and a plethora of diverse advice. The greatest



*Figure 1: Prototype “Home” Screen*

challenge thus far in designing the web application has been determining how to moderate the space. Given the nature of the web application and the core value of inclusion, safety and privacy are top concerns. Currently, the site is designed to have an administrator account with permission to remove any content from the site. This administrator account is also responsible for approving all articles. To moderate the question forum, users can upvote or downvote the responses. Once a question or answer receives a certain number of downvotes, it will be automatically deleted from the site. The threshold of downvotes will be set based on site traffic. Chatroom membership will be controlled using access codes, which can be distributed by current members or by the site administrator.

The web application is being developed using Django, an open-source full-stack Python-based web framework. Django was chosen because of its model-view-controller (MVC) software design pattern and ease of use. Frontend development was completed using programming languages such as custom CSS, HTML, JavaScript, and Bootstrap, a CSS framework. Backend

work will be implemented in Python. The project is hosted on Heroku, a cloud platform, and uses a PostgreSQL database. Work for the web application began in the fall of 2021 and is still ongoing. Thus far a majority of work has focused on frontend design and overall user experience research. The projected finish date for the project, including backend development and deployment, is Spring 2023. My technical adviser for the capstone project is Briana Morrison of the Computer Science department.

### **An Analysis of Technology to Improve Outdoor Recreation**

Technology has modernized the outdoors and altered people's expectations and approaches to outdoor recreation. Smartphones, in particular, have eliminated much of the uncertainty associated with outdoor activities by providing "seemingly boundless amounts of information into one little, accessible package" (Rogers & Leung, 2021). A study of national park visitors found the availability of information improves feelings of safety and security, enabling visitors to explore new challenges and go outside their comfort zone (Shultis, 2012). However, another school of thought argues that excessive digital connectivity has led to a false sense of security and a lack of preparedness in wilderness areas. Frequent GPS use physically changes the way the brain creates internal maps, which can create dependence issues and resultant anxiety. These troubling dependencies have led users to blindly follow GPSs into dangerous situations rather than trusting their abilities and instincts (Selin et al., 2020). Another highlighted area of technological potential and advancement is recreational land management. Social media has proven to be a promising source of data for gathering information on recreational land use. Public land managers can use the positive correlation between location-based social media activity and recreational use to fill information gaps and monitor protected areas (Wood et al., 2020).

In addition to physical technological innovation effects, the influence of technology on human well-being in outdoor spaces must be considered. According to a study by Martin et al., of adults in England, nature connectedness was positively correlated to “eudaimonic wellbeing and pro-environmental behaviour.” (2020) The study by Martin et al. also found that virtual interactions with the outdoors, including watching nature documentaries, produced similar benefits and feelings of connectedness. A study completed by Browning et al. supported this conclusion by stating that nature exposure through virtual reality (VR) can be used to improve mental health and promote environmentalism (2020). Given the socially constructed and contested meanings and values of land and the outdoors, an affinity for the natural world encourages conservation and sustainability efforts (Meyfroidt et al., 2022). However, research by Ho and Chang suggests that many idealized images and promotions of the natural world fail to connect with the wider populace and instead exclude vast diverse segments of the public (2021). To combat this issue, a study of equity in the outdoors by Winter et al., found evidence that technology, specifically social media, can help affirm a sense of belongingness among ethnoracial minority cultures in outdoor recreation (2019). Despite potential environmental and inclusion benefits, some naturalists remain skeptical about whether technology is improving outdoor recreation spaces and experiences or if technology itself becomes the center of the experience (Kahn et al., 2009).

Due to the controversy and evolving nature of technologies, current research lacks sufficient discussion of the intersectionality surrounding the role of technology in outdoor recreation. Researching how technology affects outdoor recreation and the ways people experience these spaces has the potential to benefit outdoor visitors, land use managers, and conservationists. Specifically, investigating this topic can inspire new programs to improve

outdoor interactions for diverse groups of people, while managing the environmental impact. In addition, this area of research has important policy implications, including public land protection, clean air, and clean water legislation.

### **Research Question and Methods**

For my STS research, I seek to analyze the impact technology has on the ways people experience the outdoors and answer how these technologies can be utilized to improve such experiences and outdoor spaces. My research will include an investigation of the impact of technology on safety, sustainable land management, and wellness. The investigation will begin with a literature review of technological innovations and their proposed effect on the outdoors. Next, case studies will be used to gather data and analyze measurable impacts, including data from national parks, public lands, and outdoor recreation groups. In addition, given the intersectionality of the topic, the investigation will include studies relating to sustainability, public policy, and health. These interdisciplinary resources will provide insight into the larger picture surrounding what society needs from the outdoors and how to provide those experiences feasibly. Due to the controversy of this topic, conflicting statements and points of view on the impacts of technology will be explored to provide a complete picture of the role of technology in outdoor recreation.

### **Conclusion**

In order to connect the larger Appalachian Trail hiker network, I will design and create a web application to facilitate an inclusive digital community. Once completed, this web application will provide a safe space for connecting with ours and provide a platform for diverse hiker voices. The design will also offer comprehensive resources and how-to guides designed to

encourage outdoor participation. Whereas my capstone project focuses on utilizing digital products to encourage outdoor recreation, my STS research will analyze the role of technology in outdoor spaces. Specifically, the impact of technology on the ways in which people experience the outdoors and the applications of technology to improve such experiences and outdoor spaces will be investigated. Analyzing the relationship between technology and outdoor recreation can help inspire new ways technology can be employed to benefit outdoor experiences and identify potentially harmful effects on outdoor spaces.



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