

DESIGN AND DEVELOPMENT OF A KINETIC POWER PACK

THE RISE OF SOCIAL MEDIA LEAVING ITS TRACE ON NATIONAL PARKS

An Undergraduate Thesis Portfolio
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Bachelor of Science in Mechanical Engineering

By

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SOCIOTECHNICAL SYNTHESIS

As society becomes more technologically advanced, smart phones continue to be a necessary tool in modern culture. The technical design project aims to create a device to allow outdoor enthusiasts to charge their devices while away from electricity. The Kinetic Power Pack will help hikers stay connected to society and continue using their cell phones as a communication device, GPS, flashlight, etc. The Science, Technology, and Society (STS) portion of this topic explores social media usage within national parks. People use their cell phones and connect to apps such as Instagram, Facebook, and Twitter while exploring natural wonders and post beautiful photos to their social media accounts, tagging locations and sharing to a large network of users. As outdoor enthusiasts use the Kinetic Power Pack, they can use the extended charge on their smart phones to continue posting and sharing images on social media.

On trips and adventures lasting days and trekking thousands of miles, hikers need to keep their devices charged in case of emergencies or if they want to snap a quick photo. The capstone design, the Kinetic Power Pack, uses human movement such as arm or leg oscillations while walking or running. This movement forces a magnet to move in and out of a coil within the device which will in turn produces electricity.

Over the past academic year, the product has gone from the drawing board to a 3D printed prototype. The development of the device was halted by the sudden end of the semester; however, the team was able to produce a working prototype. Though some products currently exist on the market, the Kinetic Power Pack is more versatile and lighter than its competitor by Tremont Electric at only 9.3 ounces. Further testing is required to continue the progress on the capstone project such as stress tests, more user testing, and additional cost analysis.

The STS portion of this report focuses on the impact of social media usage on national parks. The research attempts to answer the question of how parks and visitors can manage the negative impacts from increased visitation on the environment with the positive impacts of diversifying the visitors and collecting visitor data using social media. Social media allows virtual visitors to connect to national parks and spread images of the beautiful scenery. But as more people engage with the photos and visit the tagged locations, the increased visitation strains the parks and its surrounding ecosystems. The research examines both articles and scientific journals in order to identify the scope of the problem and suggest possible solutions. Bikjer's Technology and Social Relationships model maps the problem to explore how social media users are connected to national parks.

Research into the topic of the connection between social media and national parks identified both positive and negative outcomes. Tagging locations on social media posts while visiting national parks allows the park service to have a form of visitation data to allow the allocation of resources and support infrastructure development. The various platforms also promote public engagement, diversifying the population of national park users virtually. However, some visitors neglect their personal responsibilities and harm the fragile environments by overcrowding resulting in a higher pressure on the environment. Balancing both sides of the problem will allow for technological progress as well as preservation of the national parks. As society continues to progress, the National Park Service and its visitors have to understand their impact both virtually and physically.

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PROSPECTUS

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