

## Mobile Security System

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Since the late 1970s, security systems have played an important role in people's everyday lives. Since their early development, engineers and researchers have made sophisticated changes to security systems to improve their effectiveness. Today, security systems, and especially security cameras, are in use everywhere—even doorbells utilize cameras. There are instances in modern times that do not have access to power. For instance, there are places that don't have power connected for various reasons. Such reasons could be old construction that was not planning on having security, or new construction that does not yet have power. Therefore, some source of power would need to be provided to install a security system. For example, there are golf courses and parks in Springville, Mapleton, Spanish Fork, and construction sites that do not have direct access to power. The end user would have a decision to make, risk the chance of property being stolen or damaged, or run a permanent power line. However, this can be a very costly endeavor. The city of Spanish Fork has a golf course that uses security cameras and was looking for a solution that did not require them to run an estimated hundred-thousand-dollar power line. This solution is not cost-effective, rendering it unreasonable. A product that is more cost-effective but still prevents theft would be very valuable in today's market.

We have designed a security system that can be moved to any location and run on a self-sufficient power source. The security system that allows the end user to have direct access to what is happening at that current time. This system will utilize a raspberry pi to control essential functions of security. The raspberry pi will be powered by a lithium-ion battery that will be charged by a solar panel. Utilizing monocrystalline solar panels, the system will have an "efficiency range of 15-17%" [2]. This will allow us the ability to recharge and keep a system of continual power. This allows the system to be monitored by a user as well as the raspberry pi. The raspberry pi has a fan so it can regulate the temperature that is controlled by a thermometer. By making the system capable of turning on and off the fan we can save power. The pi will also be able to monitor by motion an area that is covered with a camera. When motion is detected, it will turn the camera on and record what happened. It will then notify the application. This application will allow viewing current readings from the raspberry pi such as temperature, past motion, current, voltage, and power consumed. This application will be programed in Java and made to run the python programs that control functorially of the raspberry pi.

## Sources

- [1] Gowda, M., Hajare, R., Mehta, H. A., Arvind, V., Kumar, S. L., & Rao, J. A. (2016). Solar powered intelligent infrastructure for power monitoring and surveillance system. *2016 International Conference on Electrical, Electronics, Communication, Computer and Optimization Techniques (ICEECCOT), Electrical, Electronics, Communication, Computer and Optimization Techniques (ICEECCOT), 016 International Conference On*, 110–114. <https://doi-org.ezproxy.uvu.edu/10.1109/ICEECCOT.2016.7955196>
- [2] M. Huot, L. Kumar, J. Selvaraj, M. Hasanuzzaman and N. Rahim, "Performance Investigation of Tempered Glass-Based Monocrystalline and Polycrystalline Solar Photovoltaic Panels," *International Journal of Photoenergy*, pp. 1-8, 2021