Intro to Embedded Systems → Executive Summary

Day & Knight Security System

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Introduction

Home security systems, today, tend to be more reactive, than proactive. These systems catch the perpetrator in the act and notify the homeowner and police, but do not seem to have methods to prevent the perpetrator from getting that far. As a result, they act as a watchful eye, rather than a protective shield. Another feature most security systems lack is a method of efficiently and safely scaring away animals that tend to raise havoc on the premises. This could be very costly if the damages incurred are more than the amount the insurance companies are willing to cover. Even more costly are the systems that automatically call the police when an intruder is detected, even during a false alarm or an animal-break in. It would be more cost-effective if these systems left the decision up to the homeowner. The *Day & KNight Security System* is a feasible solution to these problems because it offers a unique, low-cost method of keeping unwanted visitors, human or animal, away.

Description

The *Day & KNight Security System* uses infrared sensors to create an invisible beam at a specified distance from the home. When someone passes through the beam, a notification will be sent to the homeowner's phone via Bluetooth. If someone passes through it at night, a soft-sounding alarm will emit from a buzzer and the homeowner can choose to have a light turned on as well. At the discretion of the homeowner, if no action is done to deactivate the system and the intruder is still there after three seconds, the sprinklers will come on for a specified amount of time.* If someone reaches the door, a weight sensor will detect their presence and notify the homeowner via Bluetooth. Originally, the system would then use an accelerometer to determine if the person's knock matches the knock pattern saved by the homeowner and, if so, would unlock the door. Unfortunately, this feature is still under development, so, the system will only unlock the door if the homeowner confirms through their phone. If the intruder tries to open a window, the alarm will sound as well and the homeowner would be notified.

*Note: The purpose of this feature is more for scaring away animals, though it could have some success in keeping away people as well. This feature is also currently under development and will be available soon.

Future Enhancement

In designing this system, there was an issue in getting the accelerometer to perform properly, mainly, due to both the part's poor quality and time constraints in developing a full understanding of the functionality and implementation of Inter-Integrated Circuits (I^2C). This security system could be improved by resolving this issue. This could be done by researching and obtaining the most efficient accelerometer, rather than the cheapest one. Once that is taken care of, the next step should be collecting enough research and examples to familiarize one's self with the workings of Inter-Integrated Circuits, so that, should any error arise, it should not be very difficult or time-consuming to resolve it. The inclusion of cameras might also increase the efficiency of this system by allowing homeowners to truly visualize what is occurring on their property when they are away.

Conclusion

Although, for the time being, it lacks the uniqueness of the knocking password that would have come from the accelerometer and the sprinkler system feature, the *Day & KNight Security System* is still an effective, efficient, and unique shield protecting homes, while allowing people to enjoy their lives without having to worry about unwanted intruders.