Optimized high speed SMS based alarm system for home security

Ruth Anyango Oginga

Department of Computer Science

School of Science Engineering and Technology

Kabarak University

P.O. Private Bag 20157

Kabarak, Kenya

ruthanyango2002@yahoo.com;

oginga.anyango@gmail.com

INTRODUCTION

- Home owners requires a system that would alert them of any intrusion in case they are away with their families or at home with their family, but in today's society there are many different kinds of home security options. usually the cheaper the system, the less it offers the customer.
- The fundamental principle is to devise an application or a tool that would provide a piece of mind and security to the home owner. the approach to this system is a standalone system.
- Once installed the system would allow the home owner to literary call his home and find out the status of the home from anywhere around the world.

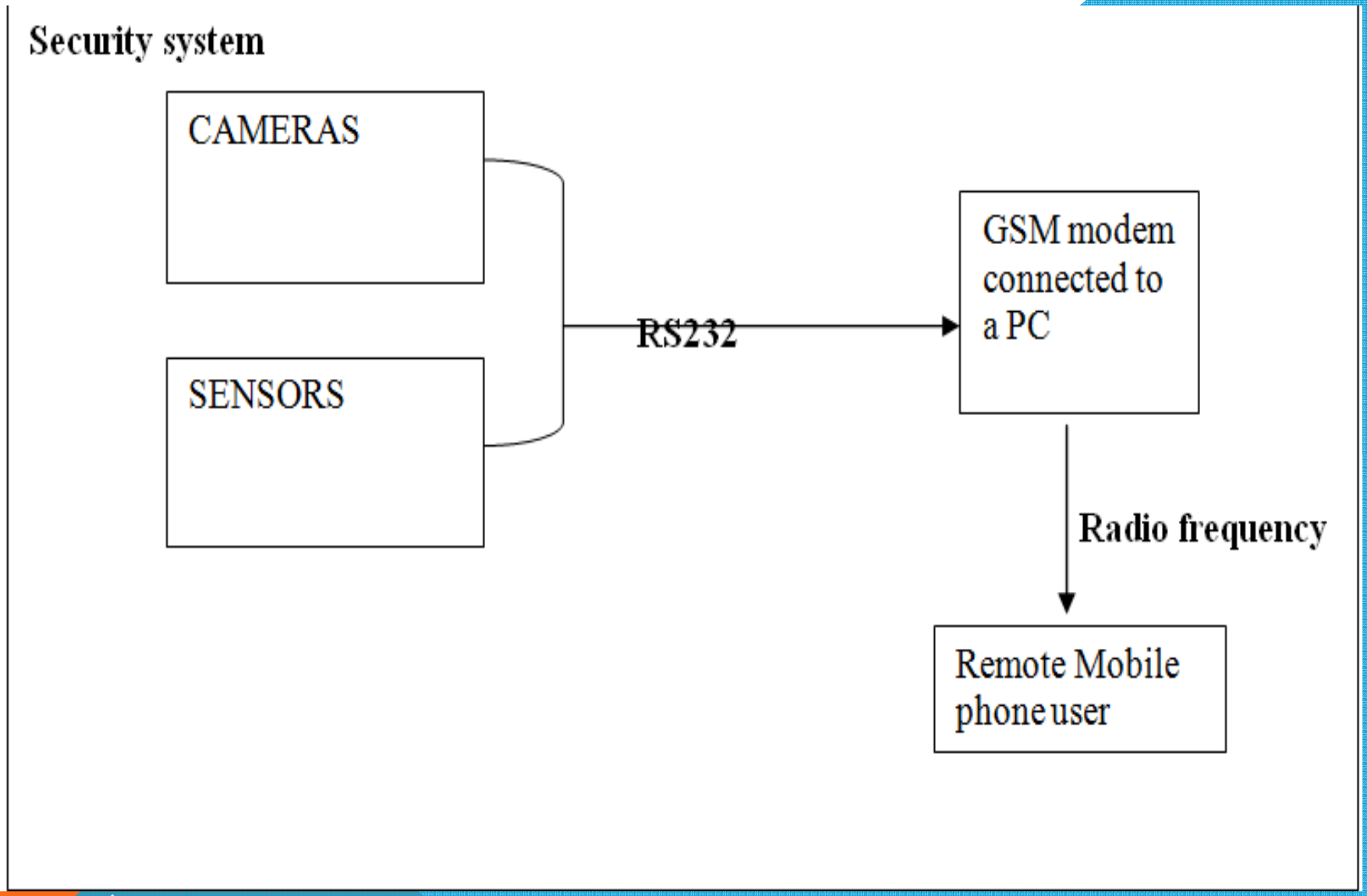
- A common question arises, how does the system know what is going on around the home it is installed in? the answer is simple, through a network of sensors. the network includes but not limited to the door position sensors, window sensors, motion sensors and smoke detectors. by predefining what kind of sensors is included in the network the system would have the ability to send and sms to the home owner.
- The aim of the paper is to focus on the controlling of home security remotely and providing security when the user is in a remote location.

SMS BASED ALARM SYSTEM

- The system has an interface through the rs232 port to the device (GSM modem) with the sim card acting like a phone connected to a pc that allows the user to dial into the system and monitor the home's status.
- The modem connects the user through radio frequency. the computer has software components through which the security is controlled and monitored.
- It is a mobile technology that allows for sending and receiving text or even binary messages to and from a mobile phone.

- **PC:** PC being the main module has optimized high speed SMS based alarm system installed on it. The two subsystems; one being:
- The cameras for capturing any image that is around the home and the second subsystem being sensors to detect any motion be it fire; movementsecurity alert is responsible for security intrusion detection. Both subsystems work on GSM technology for transmission of instructions from sender to receiver.
- **GSM Modem:** GSM modem is a plug and play device and is attached to the PC which then communicates with the PC via RS232 port. GSM modem is a bridge responsible for enabling/ disabling of SMS capability.
- **Cell Phone:** Mobile device communicates with the GSM Modem via radio waves. The mode of communication is wireless and mechanism works on the GSM technology. Cell phone has a SIM card and a GSM subscription. This cell phone number is configured on the system. User transmits instructions via SMS and the system takes action against those instructions.

Frame work of the system



HOW SECURITY ALERT WORKS

- The security alert is achieved in a way that on the detection of intrusion the system allows automatic generation of SMS thus alerting the user against security risk.
- GSM hardware tests are run in order to check the hardware support. The system calls GSM modem and it get activated.
- After activation the Modem checks for hardware support. If the hardware is missing or some other hardware has a problem then errors occurs, resulting in communication failure and the application is terminated.

- If the hardware responds then the serial port-RS232 is opened for communication and GSM hardware allows transmission of SMS.
- The system then connect and after connection establishment the system detects intrusion and alerts the user about the breach and similarly the system updates status of appliances by receiving SMS from the pre-defined cell number. SMS is silently ignored if a cell number is unauthorized.

PROBLEM STATEMENT

- The problem of security has been a real issue and home owners have been targeted when they are away and even when they are at home. Home owners are at high risk of property loss and terrorism. However most of existing alarm systems is robust, for the home owner in place far from his home is not able to detect a security breach if he cannot hear the alarm. More so, these alarm system are disadvantageous to the deaf.
- The security system that the researcher would come up with after investigation would tackle aforementioned problem.

OBJECTIVES

Main Objective

- To investigate and come up with a solution that is optimized high speed SMS based alarm system to provide a security option that allows system owners to monitor their homes remotely from any part of the world.

Specific Objectives

- To investigate the existing system and provide the solution that provides and controls the home remotely
- To implement an powerful residential security system that is easy to use through SMS.
- To evaluate an optimized high speed SMS based alarm system.
- .

RELATED WORK

- According to Delgado, Picking, and Grout (2006) they consider the problems with the implementation of home automation systems. Furthermore the possible solutions are devised through various network technologies. Several issues affecting home automation systems such as lack of robustness, compatibility issue and acceptability among the old and disabled people are discussed.
- Ciubotaru-Petrescu, Chiciudean, Cioarga, and Stanescu (2006) present a design and implementation of SMS based control for monitoring systems. The paper has three modules involving sensing unit for monitoring the complex applications.

RELATED WORK CONTI

A processing unit that is microcontroller and a communication module that uses GPRS modem or cell phone via serial port RS-232. The SMS is used for status reporting such as power failure.

- According to the paper of Conte and Scaradozzi (2003) view home automation systems as multiple agent systems (MAS). In the paper home automation system has been proposed that includes home appliances and devices that are controlled and maintained for home management.

METHODOLOGY

- The methodology followed in SMS based alarm system is given as; the GSM network technology for transmission of SMS from sender to receiver.
- SMS sending and receiving is used for ubiquitous access of the home and allowing breach control.
- The system security alert system provides the remote security monitoring.

FINDINGS

- SMS based alarm system has many advantages such as remote controlling of home security, availability and ease of users. The user can get alerts anywhere through the GSM technology thus making the system location independent.
- System allowed the provision of security such that system took no action against the instructions received from unauthorized number. The required task was performed only when the pre-configured number instructed the system.
- System sents breach alert when the intrusion was detected.
- Remote Controlling capability of the system allows user to switch on/off through simulating the subsystem as directed by the incoming SMS.
- The system automatically performed tests and checked support for available features and SMS sending and receiving capability and configured system accordingly.

- The structure of this system is simplified yet complex in a way that the system requires sensors that will trigger the computer to send an SMS to the owner and also trigger an alarm sound.
- This makes the system complex and expensive to develop maintain and use. It only works in areas with internet connection and hence relatively expensive. Webcams have low resolution and are not that effective.
- The system is vulnerable to power failure but this disruption can be avoided by attaching the voltage source thus allowing users to avail the great advantage of this system.
- But all in all the system advantages are more than the disadvantages, the expense is worth it.

Conclusion and Future Work

The approach discussed in the paper is original and has achieved the target to control home security remotely using the SMS-based system satisfying user needs and requirements. The system is not only secure but also useful to people that are usually far from their homes.

The system allows remote access of home security and control. This system gives a home owner a peace of mind when away from home since everything can be monitored.

For future use, wireless sensors should be used and Foscams that have motion sensor capabilities can be used to avoid use of another network of sensors.