

Camera based Monitoring System

Hexiang Jia
Department of Computer Science
Binghamton University
Binghamton, NY
hjia3@binghamton.edu

ABSTRACT

This project can use idle digital equipment as the camera of the monitoring end, and can use the available digital equipment at hand as the viewing end to monitor the situation in the home in real time, and can identify the dangers and other situations that may occur in the home, which is a good solution To worry about the situation at home when you are not at home.

KEYWORDS

Camera,Monitor

1 Introduction

Nowadays, people in society have more and more digital devices on hand, and many of them are disused and idle. So I came up with the idea of doing this project, which is to use these idle digital devices as a monitoring terminal to monitor the home. In order to prevent dangerous situations at home. And, you can also use this item to identify possible hazards, such as a fire at home, or a burglar in the house, and pets messing up your home when you are not at home. This item will alert you when no danger occurs. The home is safe.

Below are some bad situations that may occur happen in the home.



Figure 1 pet makes everything messed up



Figure 2 house is on fire

2 Hardware and Software

2.1 Hardware

Recognition program is based on Linux environment, and only one Android phone and a laptop are needed. I am using a Xiaomi 9 and a Lenovo laptop to test.



Figure 3 Xiaomi 9

2.2 Software

Android system: MIUI 12.0.6

Linux VM: Ubuntu 20.04.2

3 Design and implementation

For the overall structural design, I designed as:
First, I'll use the camera of the phone to capture the object, which is in front of the camera, and then I'll use an app called Alfred System to upload these captured pictures to my laptop. And I'll use a recognition program on Linux to recognize it, and then send different type of alerts.

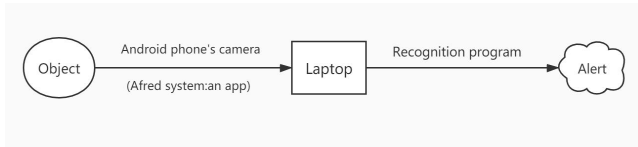


Figure 4 Data Flow Graph

4 Experiments

I'll use 4 types of pictures as input to test my program and the figures below are the results.

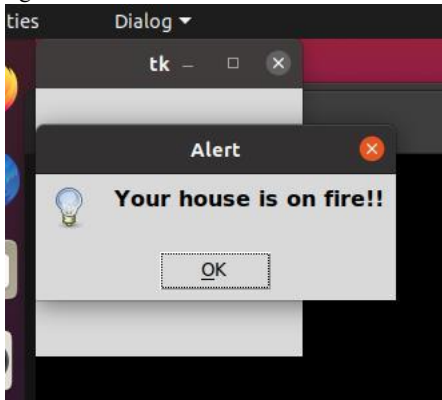


Figure 5 When the program detect your house is on fire

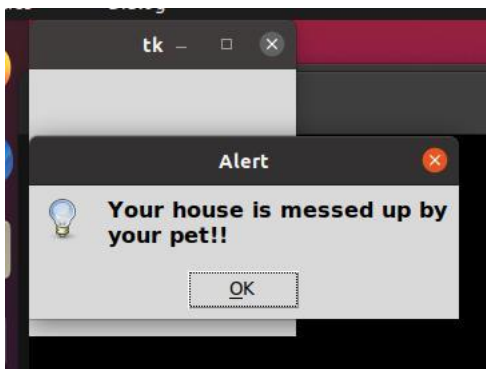


Figure 6 When the program detects that your house is messed up

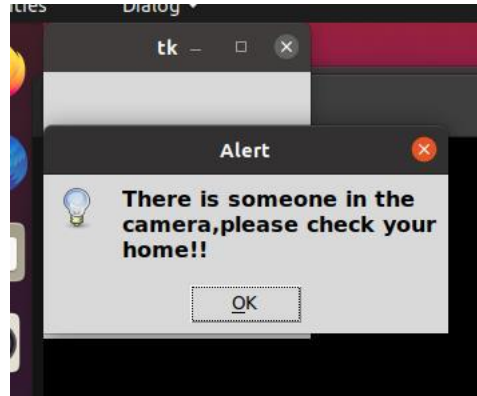


Figure 7 There is someone in your home

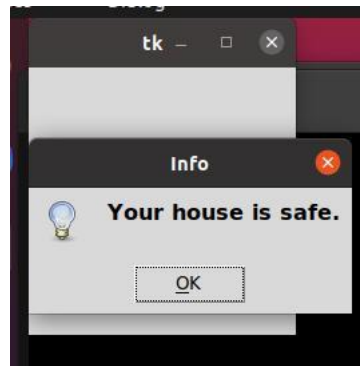


Figure 8 When you input an uncorrelated picture

5 Evaluation

At present, this project can only support the identification of three types of hazards, which can further enhance the hazard identification types of the identification program to detect more types of hazards. And now basically it is necessary to manually enter the picture. The part that can be improved includes automating the process. When the camera recognizes the danger, the mobile phone automatically alarms.

REFERENCES

- [1] <https://www.runoob.com/python/python-gui-tkinter.html>
- [2] <https://blog.csdn.net/wuxiaobingandbob/article/details/51751899>