Camera based Monitoring System

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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

Figure 3 Xiaomi 9

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.

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 types of alerts.

![Data Flow Graph](image1)

**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.

![When the program detect your house is on fire](image2)
**Figure 5** When the program detect your house is on fire

![When the program detects that your house is messed up](image3)
**Figure 6** When the program detects that your house is messed up

![There is someone in your home](image4)
**Figure 7** There is someone in your home

![When you input an uncorrelated picture](image5)
**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