Removing Physical Limits, SECUIRITY CAMERAS OF THE FUTURE

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The abstract goes here.

***Index Terms*—IEEEtran, journal, LaTeX, magnetics, paper, template.**

I. INTRODUCTION

THIS paper discusses ...

A. Background, motivation

- Goals of the paper, What problems this papers solves

1) Today's applications (summary)

- Some things current Smart Camera networks assist with when it comes to surveillance and crime detection nodes.

II. REQUIREMENTS FOR TODAY'S WIRELESS SMART CAMERA NETWORKS

- What are some more recent technologies being used and discovered by researchers today.

III. WIRELESS SMART CAMERA NETWORKS TAXONOMY

- Purpose criteria for classification of wireless Smart camera networks

- A comparison chart of different hardware components of their systems being used

- A comparison chart of software design features (computer vision, network topologies, bandwidth/energy saving techniques, etc.)

- Explain each classification criterion, provide examples, etc.

IV. EXAMPLE WIRELESS SMART CAMERA SYSTEMS

- Going into more detail of possibly one of the examples shown above in the taxonomy

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V. OUR PROJECT

A. Hardware

- Discuss breifly about the different components and why they were chosen

1) WiFi 802.11n

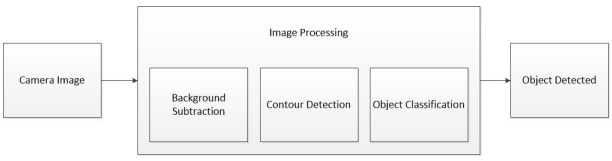
2) MSP430

B. Software

1) Image Processing

Considering the constraints of the system in terms of price and hardware, it is used techniques of background subtraction to do the object detection. When started, the program keep taking pictures and process them using Mixture of Gaussian (MoG) method by Stauffer and Grimson. With the foreground in hands we find the contours and then a bounded box is applied following the contours' limit. To remove some noise and false detection a step is added to ignore objects of small size. The object classification is the most processor consumption processes for most of the pedestrian detection systems, because it is used training techniques to classify the objects based on a previous stored database. In our case, to reduce the process we classify the objects by looking at their dimensions, they are classified as human if the height is two times bigger than the width we classify as a person.

This light system can generate some false alarms, but in association with the whole system, and its sensors, it can be improved for a better performance. There are other more robust object detection methods that could be used, but we would have a very low fps rate.



We developed using the Raspberry Pi camera module, which has already an API in C language and capable of capturing 1920x1080 resolution color images with 30 fps rate. For the image processing, we chose the Open Source Computer Vision Library (OpenCv). Our computer vision system is developed in C++ for better integration between the OpenCV and the API.

C. Future Goals

VI. Future Directions for Smart Wireless Camera Networks

- Discuss research that has been proposed in the area and that is just begining to be implemented or hasn't yet at all.

VII. Conclusion

- tie up paper

Acknowledgment

- might not need this ...

References

[1] H. Kopka and P. W. Daly, *A Guide to LaTeX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.

Kevin Abas Biography text here.

Caio Porto Biography text here.