



International Journal on Recent Researches In Science, Engineering & Technology

(Division of Computer Science and Engineering)

A Journal Established in early 2000 as National journal and upgraded to International journal in 2013 and is in existence for the last 10 years. It is run by Retired Professors from NIT, Trichy. It is an absolutely free (No processing charges, No publishing charges etc) Journal Indexed in JIR, DIIF and SJIF.

Research Paper
Available online at: www.jrrset.com

ISSN (Print) : 2347-6729
ISSN (Online) : 2348-3105

Volume 3, Issue 1
Jan 2015.

JIR IF : 2.54
DIIF IF : 1.46
SJIF IF : 1.329

Bluetooth Based Smart Low Power Wearable Video Camera Safety Device

Dr.S.Mythili¹, Dr.S.D.Umarani², S.Mathumitha³, S.Yuvaraj⁴ ^{1,2}Professor, Department of Electronics and Communication Engineering Mahendra Engineering College (Autonomous), Namakkal, Tamilnadu, India ^{3,4}Assistant Professor, Department of Electronics and Communication Engineering Mahendra Engineering College (Autonomous), Namakkal, Tamilnadu, India

Abstract

An innovative body wear camera or just referred to as body-cam device could be a person proof capture system that might record all those activities happening in it's near the field and additionally acts as a primary line of defence in a very vicious scenario. This device is made to assist the people by their safety and security and might even be employed by enforcement authorities. The device is hands free, enabling quality of the user and prepared in any respect times. It will record each image and audio into its memory and a lot of significantly provides emergency facilitate services such panic alert SMS and sound alarm. The device provides a primary person perspective of the crime scene, that is exclusive and a lot of powerful visual proof than pictures provided by fastened cameras and even Smartphone cameras. This can be greatly helpful for enforcement authorities because it provides a lot of complete chain of proof, capturing the proof in totality.

Keywords: ARM Cortex-M4, MEMS, PIR motion device, OV2640 camera device and STM32F429 Microcontroller.

I. INTRODUCTION

Crime rate everywhere the country is continually on the increase over the years. Particularly, violence against ladies has become an outstanding topic of debate in recent times [1]. The national crime record department reveals that a criminal offense against a lady is committed each three minutes and a lady is raped each twenty nine minutes [2]. Alternative kinds of violence like drug trade, corruption and police misconduct are severely disrupt the security of individuals and inhibit the event of this nation [3]. With such weak government authorities and enforcement activities, it's currently more and more vital for United States, engineers, to come back up with new ideas and product that apply the newest advancement in technological developments to bring down this act of violence and crimes altogether its forms.

As this can be a tool used for judicial proof, the information integrity and security is of tremendous importance. Associate in anti-tamper button is employed to observe tries of unauthorized access [4]. The device is joined with a Smartphone exploitation Bluetooth wireless affiliation. Smartphone is employed as an entry for outer world communication. Associate in humanoid app helps the device to send alert SMS to those contacts just in case of Associate in emergency [5]. The contact numbers will be emended and hold on within the permanent memory of the device. The Smartphone ought to be but 10m aloof from the device to be ready to maintain a correct Bluetooth affiliation.

II. PROPOSED SYSTEM

The device has the subsequent options to be enforced. Being a mobile device with restricted storage capacities, the look ensures that image associate in recording can happen only throughout an emergency event triggered by the user. The device supports up to 8GB of aboard memory. Figure 1 shows that the hardware module.

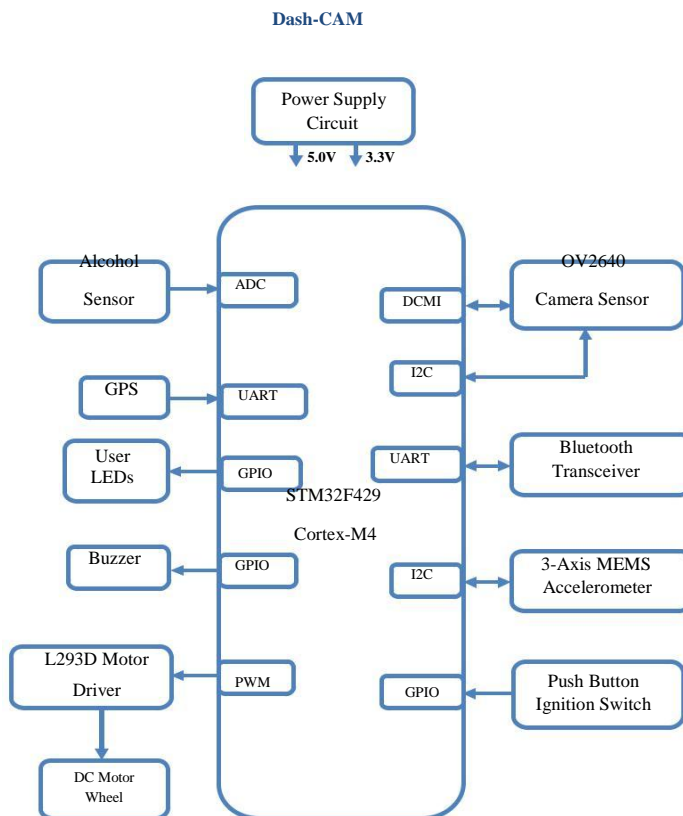


Figure 1: Hardware Module

The device has the following features to be implemented.

- 1) **Event Capture to Onboard Memory** – Being a mobile device with limited storage capacities, the design ensures that image and audio recording will happen only during an emergency event triggered by the user [7-8]. The device supports up to 8GB of onboard memory. A microSD card is used as the storage memory. External flash memory chip can also be used for this purpose. The image files are stored as .bmp or .jpg files in the memory area. OV2640 camera image sensor is used as video camera sensor. It can output images at resolutions ranging from QQVGA upto SVGA.
- 2) **Audio Recording** – Audio recording is supported and will be recorded and saved as .wav files. A MEMS microphone sensor is used for this purpose.
- 3) **Gesture Trigger** – The system cannot recognize an abnormal situation on its own. The user should double tap the device to trigger the recording process. At other times the device will be in low power mode, consuming least amount of power. A MEMS accelerometer sensor is used to identify gesture trigger motion.
- 4) **Panic Alert SMS** – A push button on the device allows the user to send a distress alarm SMS to all those emergency contacts stored in memory.
- 5) **Sound Alarm** – The device is also able to trigger a loud beep signal which would be audible to those passers-by and very close neighbours. This way it can render help more quickly.
- 6) **Life Logging** – The device is able to take photograph on its own at a regular interval, say 30 seconds, to be used as a record of activities of your entire day. A gentle tap on the device will immediately take a photograph.

- 7) **Surveillance Camera** – The device can be used as a standalone security and surveillance camera, while is not worn on the body. At this time, it checks for motion and abnormal sound triggers and starts to record images for up to 30 seconds and then stops [6].
- 8) **GPS Location Tracking** – A location query SMS can be sent to the device which will reply with the current GPS location. The device has an accurate GPS sensor, and helps others to know the current location of the person.
- 9) **Virtual Fencing** – This feature restricts the user movement within a particular area. When the user moves out of a predefined area the contact numbers would immediately receive an SMS alert informing the current location of the user.
- 10) **Tamper Protection** – As this is a device used for judicial evidence, the data integrity and security is of tremendous importance. An anti-tamper button is used to detect attempts of unauthorized access.
- 11) **Smartphone Connectivity** – The device is linked with a Smartphone using Bluetooth wireless connection. Smartphone is used as a gateway for outer world communication. An android app helps the device to send alert SMS to those contacts in case of an emergency. The contact numbers can be edited and stored in the permanent memory of the device. The Smartphone should be less than 10m away from the device to be able to maintain a proper Bluetooth connection.
- 12) **USB Mass Storage** – The device enumerates itself as an USB mass storage device when connected to a host computer which enables transferring the stored files to the host. The device can be accessed via USB only after an authentication process.

III. RESULT

Thus the protection primarily based body wear camera is meant exploitation the ARM Cortex-M4 Microcontroller for low power consumption to beat the matter round-faced by folks. This device will ready to capture and store 30fps for future references. This can be wide helpful for enforcement authorities because it provides a lot of complete chain of proof, capturing the proof in totality.



Figure 2: Hardware Implementation

PERIPHERAL	PORT	DETAIL
Power		For USB ---> Power_switch on the Board must faced towards USB. Give 5V Power through Adapter (J5 connector) on STM32F429 NUCLEO board For Adapter ----> Power_Switch on the board must faced towards 5Vin NOTE: Only 5V DC Adapter must be used A 5V Power Extension Board (Dotted Board) may be used to Supply Power to Project Peripherals(
Jumper Wires		Female-to-Female (Qty - 20)
MEMS Accelerometer (LIS302DL)		I2C2 (J11 connector) (Use Jumper Wires)
OV2640 Camera Board		Connected to J10(DCMI) on STM32F429 NUCLEO

Project Demonstration Procedure

- 1) **During Start up, first switch on the Microcontroller Board.**
- 2) **Give 5v power supply.**
- 3) The BT interface App should be installed in the ANDROID SMARTPHONE.
- 4) **Connect bluetooth (HC-05) with android mobile phone.**
- 5) Open the App a BT interface free trial screen will be displayed and Bluetooth is automatically enabled.
- 6) In that BT interface free trial screen Press “Screen1” button a window is opened scroll down to the bottom and click the check box CR.
- 7) Come back to the Main Menu of the BT interface App choose “Discover” button.
- 8) The Smartphone will be searching to find enabled Bluetooth devices, after completing the Search, a select device dialog box appears.
- 9) In that dialog Box choose respective enabled device then password will be asked for pairing the two devices.
- 10) Enter the password as “0000” or “1234” two devices will be paired and Smartphone can communicate with robotic dog.
- 11) After the two devices have paired the Led which is in the Bluetooth module glows steadily and Print “Connected “in smart phone app display.
- 12) Immediately a Screen “BODY CAM” commands Menu will be opened.
- 13) Before selecting the Life logging mode, capture the images automatically. Press Sw1: Stop life logging mode.
- 14) If you selecting the location tracking mode, track the locations.

- 15) If you selecting the panic alert mode automatically sent the sms (save numbers) to particular person.
- 16) Surveillance Camera captures the images. All the images stored in memory card.
- 17) Image Read –
 1. Connect USB
 2. Enter password
 3. Window Open after that image read (4 folders).

IV. CONCLUSION

This paper displays Associate in Nursing instrumentation set up of a run time and compiler time reconfigurable RBM primarily based ANN for 'human stance' identifying proof in 'dependably on' BWCs. Configuration area investigation uncovers the necessity for calculation instrumentation co-advancement and represents a base vitality configuration purpose for thirty physical NPCs. At the little scale mum vitality purpose, wespendlessthan5nJperframeand accomplish Associate in accuracy of eighty fifth for such a restricted getting ready set and shallow system, whereas hitherto maintaining the continuing constraints.

REFERENCES

- [1] Steinberg, E. and Prilutsky, Y., FotoNation Inc, 2002. *Digital camera with biometric security*. U.S. Patent 6,433,818.
- [2] Fleck, S. and Straßer, W., 2008. Smart camera based monitoring system and its application to assisted living. *Proceedings of the IEEE*, 96(10), pp.1698-1714.
- [3] National enforcement and Corrections Technology Center (NLECTC). "Primer on Body-Worn Cameras for enforcement." (2012).
- [4] Zitouni, M. Sami, et al. "A low-power 65-nm ASIC implementation of background subtraction." *Innovations in data Technology*, 2014.
- [5] Krizhevsky, et al. "Imagenet classification with deep convolutional neural networks." 2012.
- [6] Liang, J., Doermann, D. and Li, H., 2005. Camera-based analysis of text and documents: a survey. *International Journal of Document Analysis and Recognition (IJ DAR)*, 7(2-3), pp.84-104.
- [7] Hildreth, E., Qualcomm Inc, 2014. *Enhanced camera-based input*. U.S. Patent 8,659,548.
- [8] Clarke, D., Gassend, B., Kotwal, T., Burnside, M., Van Dijk, M., Devadas, S. and Rivest, R., 2002, August. The untrusted computer problem and camera-based authentication. In *International Conference on Pervasive Computing* (pp. 114-124). Springer, Berlin, Heidelberg.