

Automatic Toll Collection by Using QR Code Capturing

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Abstract- An embedded system based on the quick response code, camera and application program is developed for toll collection and crime investigation. Capturing QR code by using camera and recognise it. When camera capturing the QR code automatically the barrier is open and if the QR code is correct means that person's number plate is authenticate .After recognise the string from QR code it will perform the task of transaction. The amount of toll tax reduced from account number registered with vehicle at the time of vehicle registration, if the vehicle is unauthorised that time message sent to RTO.

Keywords- QR code, Camera, Application program, VB.net.

INTRODUCTION

To avoid the limitation of present QR code algorithms which are only available on the paper presswork, proposed an algorithm based on Pattern Recognition to realize the identification of the QR codes printed on various materials with different models. The QR codes from the sample images were manually marked first, and then the input images were divided into blocks. For every single block, its MRH and LBP features were calculated and such texture patterns were trained to obtain a QR code identifier using the Spatial Boost algorithm. For real-time identification, this identifier could divide the real-time input images, and output the classified results of the blocks, considering the texture features (MRH, LBP) of the blocks as input vectors. The blocks confirmed to be 2D barcode were combined into QR codes. The QR codes identifier obtained by the last training reached a 100% rate of detection in the test database of the experiment. With the rapid advances in mobile communication technologies, QR code in the embedded camera devices has been used as new input interfaces. However, the previous works for extracting QR code from an image do not consider a non-uniform background. In this paper, we implement the applications of QR code and propose an efficient algorithm to extract QR code from the non-uniform background. In contrast with prior works, our approach is of higher accuracy for QR-code recognition and more practical for use in a mobile information environment. Proposes a system for decorating QR code, the most popular two-dimensional barcode in Japan, with a facial image by Interactive Evolutionary Computation (IEC). QR code uses Reed-Solomon code which has error correction function, so a few images can be put on some appropriate positions of the code without

damaging the implanted information; however it is hard to find such appropriate positions because they depend on QR code instances and images. The proposed system allows a user to capture his/her facial image with ease, to encode a sentence into a QR code, and to find good positions for the facial image on the code. Furthermore, the proposed system enables the user to choose the most desired design by iteratively selecting candidates the system displays. A simple experiment has shown that the proposed system makes a QR code decorated with a facial image within 10 to 20 minutes involving the time when a user thinks the implanted message and chooses a color.

QR codes seem to appear everywhere these days. We can see them on posters, magazine ads, websites, product packaging and so on. Using the QR codes is one of the most intriguing ways of digitally connecting consumers to the internet via mobile phones since the mobile phones have become a basic necessity thing of everyone. A methodology for creating QR codes by which the users enter text into a web browser and get the QR code generated. Drupal module was used in conjunction with the popular libqrencode C library to develop user interface on the web browser and encode data in a QR Code symbol. The experiment was conducted using single and multiple lines of text in both English and Thai languages. The result shows that all QR encoding outputs were successfully and correctly generated.

In order to improve the practical application property of the two-dimensional barcode Quick Response (QR) code, we investigate the coding and decoding process of the QR code image. Run-length coding is applied to binary QR code image so as to accelerate the identification of QR code image. The QR code is transformed into many runs of data in alternate pixels of black and white. The related runs of data among adjacent rows are formed a unit module. After the whole image has been scanned, all of such modules in binary QR code image can be generated accordingly. With a noisy QR image captured by an industrial camera as an example, the experiments of image linearization, image seeking and localization adjustment are accomplished in sequence. A decoding system of QR code is designed and the online detection experiments are carried out. The satisfied results are achieved.

QR Codes offer a number of benefits over traditional barcodes that increase their flexibility, reliability and their ease of use. When you combine these benefits, it also

results in a reduced cost of implementation which has help drive their popularity. To name only a few of these benefits:

- High Capacity
- Require Less Space
- Dirst And Damage Resistant
- Readable From Any Direction
- Structured Appending

Chances are you've passed a QR Code or come into contact with one, possibly without noticing. So what are they?

They are barcodes, very similar to the barcodes you've seen on almost every product you've bought for many years. The main different between QR Codes and traditional barcodes, is that QR Codes can store many times more data in a much smaller area due to their ability to store data in 2 dimensions rather than 1.

The QR Code is a type of two-dimensional barcode that is used to store small amounts of text or data. Different sizes and error correction levels of QR barcodes exist to store differing amounts of data with a selectable amount of redundancy. The implementations in today's mobile phone platforms such as Android can use the contents of a QR code as a URL to open in the phone's Web browser. (Apple iPhones are supposed to be able to read QR codes using the free Semacode software.) Therefore, you can track usage of these barcodes using such tools as web site log analyzers. Other data formats usable by mobile phones include vCard, which is used to store a person's contact information. Unlike URLs, usage of these cannot easily be tracked (i.e. if the user dials the *phone number* rather than opening a URL embedded inside). Although bare URLs are commonly used with QR code, vCard does have a URL field. If you want to generate QR codes from your web site, you can use Google Charts (as Adam Straughan says), or you can use one of the many libraries that exist for popular programming languages (for example, <http://phpqrcode.sourceforge.net/> for PHP, or <http://code.google.com/p/zxing/> for Java) if you wish to do so on your own server. You would have to supply a valid URL or vCard as the text to encode in order for the QR code to be scannable by a mobile phone. Industrial applications differ in what is encoded. Most likely, you would not store the QR code images themselves in the database. Instead, you would store the URL or other text contained within the barcode so that you can look up necessary information when the barcode is scanned or regenerate the barcode if needed. So if you haven't seen one before, here's a working one. You might already know how to use a QR code and if so, go ahead and scan the QR Code right from the screen.

As with any new technology that allows and encourages sharing data, there is always the chance that identification and financial information may be at risk. QR codes that are scanned to gain instant access to a text message are less likely to place a user's identity and personal information at risk than near field communication used for a contactless payment. However, consumers need to be aware that security concerns may be an issue. Both QR codes and tags using near field communication technology are designed to be accessed using mobile phones. User permissions to gain access to information grants access to user information, use

of the camera applications, the ability to read or write data, track GPS information, and browser history is required when accessing some data. All this places personal information at risk from fraudulent sites and malicious programs. Near field communication is technology that uses low frequency radio signals embedded in a microchip or smart tag similar to QR codes. Near field communication (NFC) uses technology similar to Bluetooth or Wi-Fi except the data is only able to transmit between very short distances of no more than a few centimetres. It is popular to use mobile phone daily in modern life. Among the numerous applications provided by mobile phone, barcode utility is one of the important branches. Many companies supply barcode tools for mobile phones. For example, Google's mobile Android operating system supports QR codes by natively including the barcode scanner in some models, and the browser supports URI redirection function which allows QR codes to send metadata to the applications on the device. After investigated the supplied applications on mobile devices, most of the products exhibit information accessible to every user. Differ from the traditional applications of QR Code. An offline authentication mechanism for QR codes, based on the technology of visual cryptography, it is possible to check the identity accessing to the QR codes and to control the permission to the protected data.



Fig. 1 QR code

A QR code consists of black modules (square dots) arranged in a square grid on a white background, which can be read by an imaging device (such as a camera) Processed using Reed–Solomon error correction until the image can be appropriately interpreted; Data is then extracted from patterns present in both horizontal and vertical components of the image

WEBCAM

-web cam is video camera, which is used to capture image. Generally it is connected by usb; similar cable to computer. A webcam – short for 'web camera' is a digital camera that's connected to a computer. It can send live pictures from wherever it's sited to another location by means of the internet. Many desktop computer screens and laptops come with a built-in camera and microphone, but if yours doesn't, you can add a separate webcam at any time.

There are various types. Some are plugged into computers through USB ports, but others are wireless (wifi). Other features might include:

- An integral microphone
- The ability to pan and tilt
- In-built sensors that can detect movement and start recording
- A light that, when on, will let you know that the camera is in use.

There's a wide range of things that you can do with a webcam.

Step 1: Buy your webcam from a reputable supplier, either online or a local computer shop. Webcams come in all shapes and sizes, and vary from basic models to more complicated ones that come with extra gadgets such as motion detectors. Prices vary a lot, too. Make sure that the one you choose has a built-in microphone if you want to use your webcam for chatting to friends and relatives.

Step 2: Carefully read the installation instructions before attempting to install the webcam.

Step 3: Make sure you have everything to hand that you'll need to complete your installation. The webcam should come with a USB cable that will connect it to your computer .

Step 4: The webcam package includes a CD containing important software. Insert this into your computer's CD drive. The set-up program should run automatically, but if it doesn't, click Start and then My Computer. Double-click on the disk drive as this will prompt the files to run on the CD.

Step 5: Make sure that you follow meticulously the steps of the software program – you'll be installing the drivers that allow your computer to communicate with the webcam. It may be important to plug in the webcam in a certain order with other cables and equipment, so only plug it in when prompted to do so.



Fig. 2 Webcam

Step 6: Now position your webcam. If it has a monitor clip, attach it securely to the top of your screen pointing at your face djust it so that that people at the other end can see your whole face and not just your forehead. Once you've adjusted it to your satisfaction, don't fiddle with it during a call –

there's nothing more irritating to the person you're talking to than to spend a call looking, first, at the light fitting and then at the carpet while you're chatting. If your webcam doesn't have a clip, make sure it's sitting firmly on a flat surface so that your web pictures are level.

Step 7: Now you've completed the set-up, it's time to see the results! Click Start again and find your webcam program. Double-click on it and the program will open up.

Webcams are inexpensive, real-time device webcams include a lens, image sensor, and may also include a microphone for sound. Consumer webcams provides VGA resolution video and frame rate of 30 frames per second job of webcam is to read the image from the sensor and transmit it to the host computer.

Each frame is transmitted uncompressed in RGB or YUV or compressed as JPEG. Application program

This is middleware between hardware setup and computer. Application program written in programming language like java,vb.net, or assembly language Application program having connectivity with central database of information including vehicle no, and details of vehicle registration. The task of application program is to perform transaction on database.

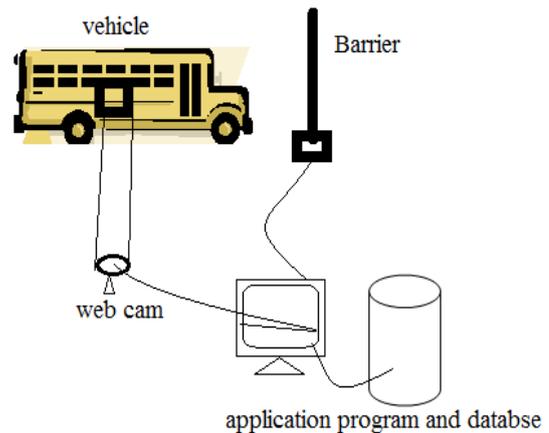


Fig. 3 Database Information

REFERENCES

- [1] Jayanta Kumar Pany , R. N. Das Choudhury, "Embedded Automobile Engine Locking System Using GSM Technology," *International Journal of Instrumentation, Control and Automation (IJICA) ISSN : 2231-1890 Volume-1, Issue-2, 2011*
- [2] Visa M. Ibrahim, Asogwa A. Victor, "Microcontroller Based Anti-theft Security System Using GSM Networks with Text Message as Feedback," *International Journal of Engineering Research and Development e-ISSN: 2278-067X, p-ISSN: 2278-800X, www.ijerd.com Volume2, Issue 10 (August 2012), PP. 18-22.*
- [3] Vinoth Kumar Sadagopan, Upendran Rajendran, Albert Joe Francis, "Anti Theft Control System Design Using Embedded System," *978-1-4577-0577-9/11 -2011 IEEE.*
- [4] Mohammad A. Al-Khedher, "Hybrid GPS-GSM Localization of Automobile Tracking System," *International Journal of Computer Science & Information Technology (IJCSIT) Vol 3, No 6, Dec 2011.*
- [5] Raj Kamal "Embedded Systems Architecture, Programming and Design" Second Edition 2009
- [6] Chaisatien, P., & Akahori, K. "Demonstration of an Application on 3G Mobile Phone and Two Dimension Barcode in Classroom

- Communication Support System". In C. Montgomerie & J. Seale (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2007* (pp 3330-3336).
- [7] Denso . About 2D Code. Retrieved June 21, 2010, from <http://www.denso-wave.com/qrcode/aboutqre.html>
- [8] Dens. Denso Wave Incorporated. Retrieved June 21, 2010, from <http://www.denso-wave.com/en/index.html>.
- [9] Liu, T., Tan, T., & Chu, Y. "2D Barcode and Augmented Reality Supported English Learning System". *Proceeding of the 6th IEEE/ACIS International Conference on Computer and Information Science* (pp 5-
- 10). IEEE Computer Society.[10] Naismith, L., Lonsdale, P., Vavoula, G., & Sharples, M. Literature Review in Mobile Technologies and Learning, NESTA Futurelab Series.
- [11] H. S. Al-Khalifa. Utilizing qr code and mobile phones for blinds and visually impaired people. In ICCHP, pages 1065{1069, 2008.
- [12] A. Alapetite. Dynamic 2d-barcode for multi-device web session migration including mobile phones. *Personal and Ubiquitous Computing*, 14(1):45{52, 2010.
- [13] R. Bose and D. Ray-Chaudhuri. On a class of error correcting binary group codes*. *Information and control*, 3(1):68{79, 1960.
- [14] M. Canadi, W. Hill opken, and M. Fuchs. Application of qr codes in online travel distribution. In ENTER, pages 137{148, 2010.
- [15] J. Gao, V. Kulkarni, H. Ranavat, L. Chang, and H. Mei. A 2d barcode-based mobile payment system. In MUE, pages 320{329, 2009.
- [16] J. Z. Gao, L. Prakash, and R. Jagatesan. Understanding 2d-barcode technology and applications in m-commerce - design and implementation of a 2d barcode processing solution. In COMPSAC (2), pages 49{56, 2007.
- [17] J. Z. Gao, H. Veeraragavathatham, S. Savanur, and J. Xia. A 2d-barcode based mobile advertising solution. In SEKE, pages 466{472, 2009.
- [18] A .Hocquenghem. Codes correcteurs d^a_A _Zerreurs. *Chi_res*, 2(147-156):4, 1959.
- [19] Y.-P. Huang, Y.-T. Chang, and F. E. Sandnes. Ubiquitous information transfer across di_erent platforms by qr codes. *J. Mobile Multimedia*,6(1):3{14, 2010.
- [20] ISO 16022:2006. Data Matrix bar code symbology speci_cation. ISO, Geneva, Switzerland.
- [21] ISO 18004:2006. QR Code bar code symbology speci_cation. ISO, Geneva, Switzerland.
- [22] ISO 24778:2008. Aztec Code bar code symbology speci_cation. ISO, Geneva, Switzerland.
- [23] S. Lisa and G. Piersantelli. Use of 2d barcode to access multimedia content and the web from a mobile handset. In GLOBECOM, pages 5594{5596, 2008.
- [24] I. Reed and G. Solomon. Polynomial codes over certain nite_elds. *Journal of the Society for Industrial and Applied Mathematics*, 8(2):300{304, 1960.
- [25] M. R. Rieback, B. Crispo, and A. S. Tanenbaum. Is your cat infected with a computer virus? In PERCOM '06: Proceedings of the Fourth Annual IEEE International Conference on Pervasive Computing and Communications, pages 169{179, Washington, DC, USA, 2006. IEEE Computer Society.