iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 3 **Issue:** IV **Month of publication:** April 2015

DOI:

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Literature Survey on Embedded Digital Image Recognition System Based On ARM-DSP

Miss. Nita Gujar[1], Prof.Shivani Pandita[2]
[1,2]Deptt. of Electronics & Telecom Engineering, Dhole Patil College of Engineering, Pune Savitribai Phule, Pune University

Abstract- Face recognition system is a computer application for automatically identifying or verifying a person. Face recognition system is widely use technique in a market now days. Since last few decades the graph of improvement in face recognition system has seen a continues rise. This are numerous application of Face recognition system like surveillance , communication, electric power etc. This paper presents a survey on various face detection technique accomplished using Principal Component Analysis, LBP etc. And detect the digital image using HAAR like features and OpenCV which is a popular open source computer vision library developed by Intel Corporation and utilized for some of the algorithms.
Keywords: Face Detection, Principal Component Analysis, HAAR like Features.

I. INTRODUCTION

Face detection is the most successful and widely used application of image analysis. There are three parts required for image recognition which are detection of image, extraction of features and then recognition. Image recognition and face detection has wide application area which includes airports, ATM machines and Email authentications etc. for security purpose, CCTV for surveillance, For personal identification and verification like banking, electronic newborns, passports and so on. This paper presents survey on a kind of high speed digital image recognition system using different techniques and algorithms.

II. LITERATURE SURVEY

Kunfeng Wang et.al. [1] proposed to use DSP board and image processing technique to construct an automated vehicle counting system. Author used TI 320DM642DSP because of its low cost and improve system structure. Real time video will be easier and more applicable if used with embedded platform for vehicle counting system automatically.DM642 DSP is based on the second generation high performance advance VelociTI VLIW architecture developed by TI it is the key part of DSP board[1]. Even in the heavy traffic scenes the proposed system is able to survive being used a lot and provide accurate information.

B.Koteswar et.al. [2] presented real time face recognition system based on ARM7 ,they used LPCARM2148 board to develop the system which required windows operating system. The system detected face by using HAAR feature and recognized by using LBP features. Windows operating system is much reliable and easier to use and has got its own help section. The main reason of selecting ARM7 by author is that it supports windows operating system easily. Real time embedded face recognition for smart home is the project in which the author proposed real time face recognition system for embedding in consumer application. In this proposal the author used LBP algorithm for face recognition and PCA as a core algorithms of the system identification.

Kandla Arora et.al.[3] provide an overview of real time application of face recognition concept by generating a Matlab code using image acquisition tool box. The author divide the recognition algorithm into two main approaches. One is Geometric approach and other is photometric approach. The Geometric features generated by segments, perimeters and areas of some figures formed by the points, Photometric approach is statistical approach which distills an image into values and compare the values with template to eliminate variance. The result of this paper is more successful by using Matlab.

Shuai Hu et. al. [4] focused to enhancing the decoding performance of H.264/AVC through memory optimization for DSP the improved H.264/AVC system increased the speed of system by 37%.H.264 defines the syntax of an encoded video bit stream together with the method of decoding bit stream. This Paper proposes Three modes, Mode 1: All the spaces of On-Chip memory are configured to SRAM that is used to store codes, data, and global variables. This mode is called ALL SRAM of L2. As for video algorithms, this mode is feasible because the direction of data streams is clear and scheduling EDMA can complete the data exchange. Yet, it will consume a lot of time once DSP accesses external memory , Mode 2: The storage space of 83Kbytes size SRAM is divided into two parts: The first one is of 64Kbytes size for cache, while the surplus is for saving codes and data, which are in common use. In this mode, the L2 cache is four-way set associative, Mode 3: The storage space of 83Kbytes size SRAM is divided into two parts: 32Kbytes size SRAM is set for cache and the surplus is used for saving codes and data[4]. In

©IJRASET 2015: All Rights are Reserved

this way, the access to SDRAM is possible to complete in a high speed taking advantage of the section is the rest of the SRAM, which is considered as cache for the other codes and data management [4]. After comparing the performance of three modes the author decides that second mode is optimum one by using this mode can improve performance of H.264 by 37%compared to the no memory optimization.

Mikołaj Roszkowski et.al.[5] distinguishes Firstly, the architecture supports all intra prediction modes defined in High Profile of the H.264/AVC standard for all chroma formats , Secondly, the architecture can generate predictions for several quantization parameters, Thirdly, the hardware cost is reduced as the same resources are used to compute prediction samples for all the modes, Fourthly, the high sample-generation rate enables the encoder to achieve high throughputs, Fifthly, 4×4 block reordering and interleaving with other modes minimize the impact of the long-delay reconstruction loop on the encoder throughput.

Jin-Su Jung et.al.[6] presented a fast H.264 intra frame encoder that processes a single macro block of 1920×1080 size video in 334 cycles on average which is 20% faster than the previous best design About 20% of the execution cycles for H.264 intra prediction are saved by the proposed pipeline schedule, early termination, and the mode selection based on IPG. Experimental results show that the proposed schedule with early termination is effective for various video sizes and quality. In spite of the significant reduction in computation time, PSNR drop is 0.0619 dB and the bit rate increase is less than 0.842% [6] Although this paper is mainly for a specific hardware, the proposed methodology can be applied to a wide range of platforms[6].

Wang et.al.[7] introduced a fully automatic framework for 3D face recognition under expression variation For 3D data preprocessing, an improved nose detection method is presented, The small pose is corrected at the same time. A new facial expression processing method which is based on sparse representation is proposed subsequently As a result, this framework enhances the recognition rate because facial expression is the biggest obstacle for 3D face recognition. Then, the facial representation, which is based on the dual-tree complex wavelet transform (DT-CWT), is extracted from depth images. DT-CWT contains the facial information and six sub regions' information. Recognition is achieved by using linear discriminate analysis (LDA) and nearest neighbor classifier. Author has performed different experiments on the Face Recognition Grand Challenge database and Bosphorus database. It achieves the verification rate of 98.86% on the all vs. all experiment at 0.1% false acceptance rate (FAR) in the Face Recognition Grand Challenge (FRGC) and 95.03% verification rate on nearly frontal faces with expression changes and occlusions in the Bosphorus database[7].

S.Nikhil et.al. In [8] DSP processor based GPS has been design and developed for file browser application. The GPS consist of transmitter, receiver and wireless module .In this Paper Author took test by considering three condition with three module and checked the output of the system.

Anumol Jose et.al.[9] presented optimization of general computer vision algorithms such as Viola Jones face detection on embedded system with limited resources to present the work. This Viola Jones algorithm is popular for face detection which can be detected on mobile platform. In this paper author selected both mobile and non -mobile platform, The mobile platform selected is BeagleBoardxM which powered by an DM3730 processor and non-mobile platform selected as the Intel processor. The result of system at the end and shows the execution time on Intel based PC is much lower than the BeagleBoardxM (ARM).Hence this paper achieve performance optimization for mobile platform application.

D.Naredar Singh et.al. In [10] design a system of Embedded automatic face recognition based on ARM 9.In this paper Author design a system which used to identify a particular person(criminals) based on the images which is already stored in the memory. Face recognition system based ARM9 used Linux based operating system. This system developed by using PCA algorithm and also low cost, portability, control chip.

Silpa P.Aet.al [12] Described Realization of Image Processing Platform on ARM9 for Face Recognition by using friendly arm board with opencv The arm board is a low cost embedded board with ARM9 as the core where as Opencv is a computer vision simulation library from Intel. In this paper the platform for image processing is prepared by porting the opencv library to the ARM9 board. proposes a low cost alternative for DSP kits for image processing. Author used Two algorithms for face recognition is implemented on the Platform which is prepared by porting the opencv library to the ARM9 board. One are based on principal component analysis and the second one is based on linear discriminate analysis. Both algorithms are tested with AT&T database.

III. CONCLUSION

We have to studied different face detection and recognition systems in which Kunfeng Wang et.al. [1] Presented a detail description of DSP board and image processing techniques, To detect and count moving vehicle in traffic scenes. Embedded face recognition system based on ARM7 on windows operating system is proposed and delivered good recognition performance which designed with the combination of embedded and MATLAB[2]. Shuai Hu results presented in this paper

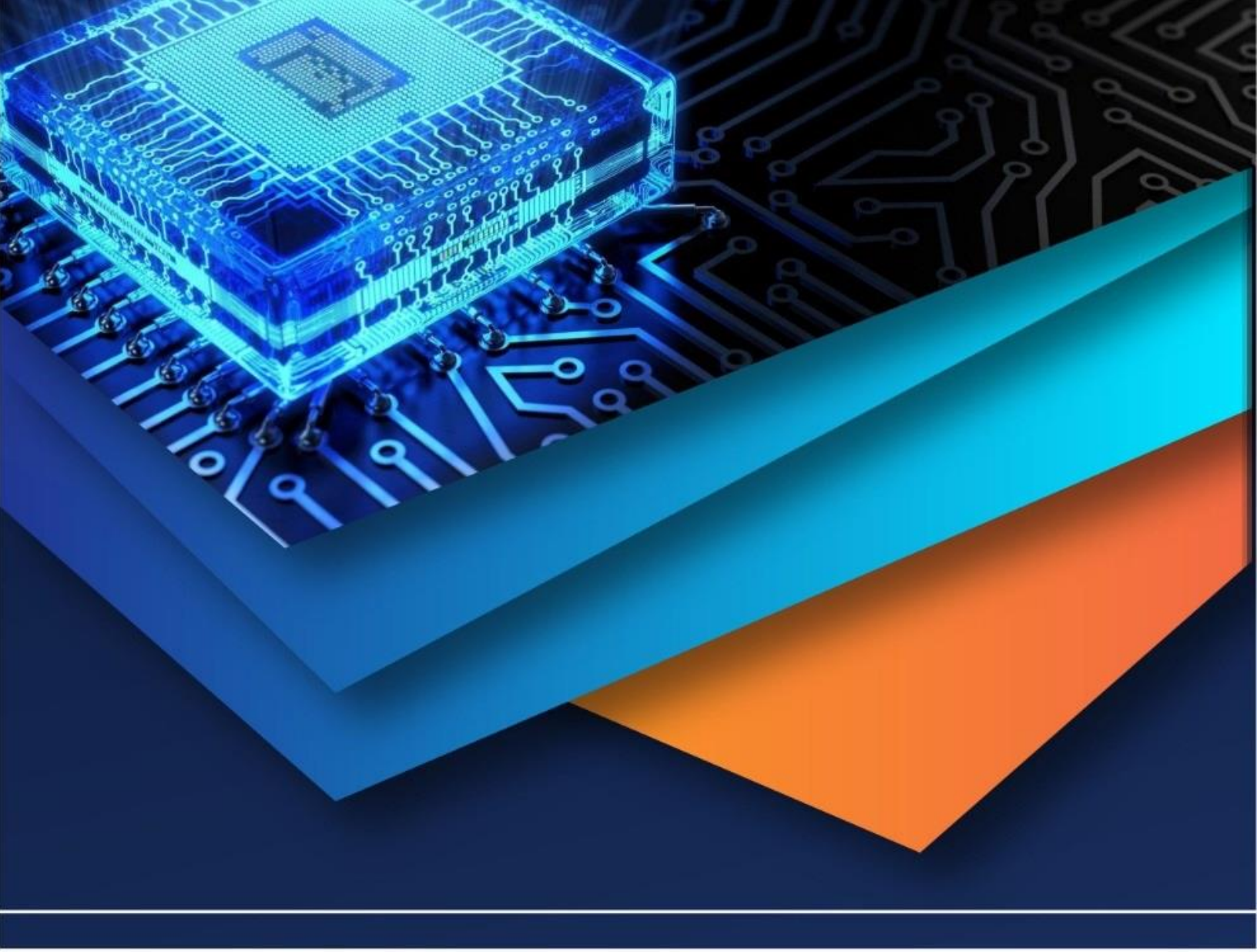
©IJRASET 2015: All Rights are Reserved

show that H.264 decoding performance can be improved by almost 37%[4]. S. Nikhil designed and developed GRS system which developed most powerful means of communication[10] Currently it is very active research area. Some of the best algorithms are still to computationally expensive to be applicable for real time processing , but this may change with coming improvement in computer hardware. after studying all this paper we conclude the image recognition system require more less power consumptive, small size and fast working microcontroller like ARM. and having a large applications in sequrity and surveillance. In this paper we study different face detection and recognition system that are capable of processing image very fast while acquiring very high true positive face detection rate with ARM and algorithm of PCA. After this literature survey we concluded that HAAR like features, used for digital image features used in object recognition. Due to the use of integral images this feature can calculated for images of any sizes. The calculated speed of HAAR like features is the key advantages over most of the features. DSP is a digital signal processor specialized microprocessor with an optimized architecture for fast operational needs of digital signal processing .

IV. REFERENCES

[1] Kunfeng Wang, Zhenjiang Li et al In "An Automated Vehicle Counting System for Traffic Surveillance NATIONAL INSTITUTE OF TECHNOLOGY JAMSHEDPUR. July 25, 2010 at 06:24:08 UTC from IEEE Xplore
[2] B. Koteswar "Real Time Embedded Face Recognition usingARM7"International Journal of Research in Computer and Communication Technology, Vol 2, Issue 5, May-2013
[3] Kandala Arora "Real Time Application of Face Recognition Concept" Kandla Arora International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-2, Issue-5, November 2012
[4] Shuai Huet.al. "Optimisation of Memory Allocation for H.264/AVC Video Decoder on Digital Signal Processors Intra Prediction for the Hardware H.264/AVC High Profile Enccoder"2008 IEEE DOI 10.1109/CISP.2008.17
[5] MikołajRoszkowski&GrzegorzPastuszak "Intra Prediction for the Hardware H.264/AVC High Profile Encoder" Received: 6 December 2012 / Revised: 25 June 2013 / Accepted: 27 June 2013 / Published online: 23 July 2013 The Author(s) 2013. This article is published with open access at Springerlink.com
[6] Jin-Su Jung et.al" A Fast H.264 Intra Frame Encoder with Serialized Execution of 4 X 4 and 16 X16 Prediction and Early Termination" Received: 19 January 2010 / Revised: 12 December 2010Published online:5 January 2011 The Author(s) 2010
[7] Wang et.ai. "Three dimensional face recognition under expression variation" EURASIP journal on image and video processing 2014, 2014:51
[8] S. Nikhil et.al "Design and Development of DSP Processor Based GESTURE Recognition System FOR Real time Applications"SASTECH volume 9 issue 1, April 2010
[9] Anumol Jose et.al "Implementation and Optimization of embedded face detection System"Proceeding of 2011 International Conference on Signal Processing, Computing and Networking Technologies (ICSCCN2011)
[10] D. Narendarsingh et.al. "Designed of Embedded automatic face recognition system based on arm9" International International Journal of Latest Trends in Engineering and Technology (IJLTET) Vol: 2 Issue 2 March 2013 ISSN: 2278-621
[11] Silpa P.A. "Realization of Image Processing Platform on ARM9 for Face Recognition"2014IEEEDOI10.1109/Icacc.2014.25

©IJRASET 2015: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)