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***Research Article** (Open Access))*

SMART HAR FOR ELDERLY AND ANONYMOUS DETECTION USING COLOR IMAGING

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ABSTRACT
Video based human activity recognitionsystems have potential contributes to variousapplications such as smart homes and healthcareservices. Human activity recognition, or HAR forshort, is a broad field of study concerned withidentifying the specific movement or action of aperson based on sensor data. Movements areoften typical activities performed indoors, such aswalking, talking, standing, andsitting. They mayalso be more focused activities such as those typesof activities performed in a kitchen or on a factoryfloor. This paper discusses the development of aneffective skeleton information based HAR whichcan be used as an embedded system. we study howcontinuous video monitoring and intelligent videoprocessing can be used in eldercare to assist theindependent living of elders and to improve theefficiency of eldercare practice. More specifically,we develop an automated activity analysis andsummarization for eldercare video monitoring. Atthe object level, we construct an advancedsilhouette extraction, human detection andtracking algorithm for indoor environments. Atthe feature level, we develop an adaptive learningmethod to estimate the physical location andmoving speed of a person from a single cameraview without calibration. At the action level, weexplore hierarchical decision tree and dimensionreduction methods for human action recognition.

Keywords: *Motion Recognition, Video Monitoring, Elder Care, Activity Analysis*

INDRODUCTION

Human action recognition has a wide range of applications, such as intelligent video surveillance and environmental home monitoring, video storage and retrieval, intelligent human–machineinterfaces and identity recognition. Human actionrecognition covers many research topics incomputer vision, including human detection invideo, human pose estimation, human tracking, and analysis and understanding of time series data. It is also a challenging problem in the field of computervision and machine learning. At present, there aremany key problems in human action recognitionthat remain unsolved. The key to good humanaction recognition is robust human action modelingand feature representation. Feature representationand selection is a classic problem in computervision and machine learning. Unlike featurerepresentation in an image space, the featurerepresentation of human action in video not onlydescribes the appearance of the human(s) in theimage space, but must also extract changes inappearance and pose. The problem of featurerepresentation is extended from two-dimensionalspace to three-dimensional space-time. In recentyears, many kinds of action representation methodshave been proposed, including local and global features based on temporal and spatial changes
trajectory features based on key point tracking,motion changes based on depth information andaction features based on human pose changes.With the successful application of deep learning toimage classification and object detection, manyresearchers have also applied deep learning tohuman action recognition. Human Action Recognition (HAR) from a set of video sequencesis a challenging problem in computer visiontechnology. Fundamental to a variety of applications in many different research areas, such as academia, security, industry, and consumer electronics. HAR is an important research because a lot of potential accidents can be avoided by recognizing and predicting the activities of human being.

During the past decades, many smart home technologies have been developed. A variety of sensors, such as gait monitors, motion sensors, and radio-frequency devices, have been designed to monitor activities of elderly persons at home and to assist their independent living Actually, the literature provides numerous examples of such research, with a variety of potential applications. However, none of this work has developed technology with a satisfactory level of performance.

LITERATURE SURVEY

[1]Nikolaus Bourbakis ,AnnaEsposito,DespinaKavraki."Extracting and associating meta-features for understanding people's emotional behavior: Face and speech." Received: 6 May 2010 / Accepted: 1 September 2010. Emotion is a research area that has received much attention during the last 10 years, both in the context of speech synthesis, image understanding as well as in automatic speech recognition, interactive dialogues systems and wearable computing. There are promising studies on the emotional behaviour of people, mainly based on human observations.

[2]Taskeed Jabid, Md. Hasanul Kabir, and OksamChae. "Robust facial expression recognition based on local directional pattern2010 ETRI journal 32 (5), 784-794; revised July 15, 2010; accepted Aug. 2, 2010. Automatic facial expression recognition has many potential applications in different areas of human computer in eraction. However, they are not yet fully realized due to the lack of an effective facial feature descriptor. In this paper, we present a new appearance based feature descriptor, the local directional pattern (LDP), to represent facial geometry and analyze its performance in expression recognition.

[3]Lu Xia, Chia-Chih Chen, and J. K. Aggarwal. "View Invariant Human Action Recognition Using Histograms of 3D Joints." In this paper, we present a novel approach for human action recognition with histograms of 3D joint locations (HOJ3D) compact representation of postures. We extract the 3D skeletal joint locations from Kinect depth maps using Shotton et al.'s method . The HOJ3D computed from the action depth sequences are reprojected using LDA and then clustered into k posture visual words, which represent the prototypical poses of actions.

[4]Baochang Zhang, Yongsheng Gao, Sanqiang Zhao, and Jianzhuang Liu. "Local derivative pattern versus local binary pattern: Face recognition with high-order local pattern descriptor." Manuscript received March 08, 2009; revised August 16, 2009. First published November 03, 2009; current version published January 15, 2010. This paper proposes a novel high-order local pattern descriptor, local derivative pattern (LDP), for face recognition.LDP is a general framework to encode directional pattern features based on local derivative variations. Extensive experimental results on FERET, CAS-PEAL, CMU-PIE, Extended Yale B, and FRGC datebases show that the high-order LDP consistently performs much better than LBP for both face identification and face verification under various conditions.

[5]Yugo Nakamura, Yutaka Arakawa, Takuya Kanehira, Masashi Fujiwara, and Keiichi Yasumoto. "SenStick: comprehensive sensing platform." Received 13 June 2017; Revised 31 August 2017; Accepted 20 September 2017; Published 26 October 2017. We propose a comprehensive sensing platformcalledSenStick, which is composed of hardware (ultra tiny all-in-one sensor board), software (iOS, Android, and PC), and 3D case data. The platform aims to allow all the researchers to start IoT research, such as activity recognition and context estimation, easily and efficiently. The most important contribution is the hardware that we have designed.

[6]A. Jalal, Md. Zia Uddin, and T.-S. Kim. "Depth video-based human activity recognition system." Manuscript received 05/28/12 Current version published 09/25/12 Electronic version published 09/25/12. Video-based human activity recognition systems have potential contributions to various applications such as smart homes and healthcare services. In this work, we present a novel depth video-based translation and scaling invariant human activity recognition (HAR) system utilizing R transformation of depth silhouettes. To perform HAR in indoor settings, an invariant HAR method is critical to freely perform activities anywhere in a camera view without translation and scaling problems of human body silhouettes. We obtainsuch invariant features via R transformation on depth silhouettes.

[7]Zhongna Zhou, Xi Chen, Yu-Chia Chung, Zhihai He, Tony X. Han, and James M. Keller. "Visual monitoring system for elderly people daily living activity analysis." Manuscript received March 06, 2008; revised July 09, 2008. First published September 26, 2008; current version published October 29, 2008. study how continuous video monitoring and intelligent video processing can be used in eldercare to assist the independent living of elders and to improve the efficiency of eldercare practice. More specifically, we develop an automated activity analysis and summarization for eldercare video monitoring. At the object level, we construct an advanced silhouett extraction, human detection and tracking algorithm for indoor environments

[8]ZainebLiouane, Tayeb Lemlouma, Philippe Roose, Frédéric Weis, MessaoudHassani. "A Markovian-based approach for daily living activities recognition." Submitted on 8 Mar 2016. Our study focuses on a particular kind of the resident that is elderly in order to provide them with required help and assistance. The considered scenarios includes: the person's behavior, the interaction with the system and surrounding objects and consider the person's degree of dependency. These scenarios will consider the constraints and difficulties that can face the resident is his daily life.

EXISTING SYSTEM

In the existing system Human beings are connected with millions of consumer electronics devices in the Internet of Things. On the other hand, side effects might exist. For example, many people use computers in home and office, resulting in increasing lengths of time sitting in one place, often with poor posture. This can lead to repetitive stress injuries. Thus, it is useful to monitor daily routines, determine unhealthy behavior, and take appropriate actions. Using self-collected datasets, such problems have been modeled, including illustrations and both hardware and software technologies have been developed for recognizing human activities. Image registration is the process of geometrically aligning two images of the same scene that have been acquired under varying conditions. Template matching, linear discriminant analysis, linear programming, and SVM are machine learning techniques available to classify facial expressions. The human body is an articulated system of rigid segments connected by joints and human action is considered as a continuous evolution of the spatial configuration of these segments (i.e. body postures). Here, we use joint locations to build a compact representation of postures.

DISADVANTAGES

- Here we use only image extraction method
- Can't get a clear vision in a single frame
- Processing time is too high
- There are only black and white images

PROPOSED SYSTEM

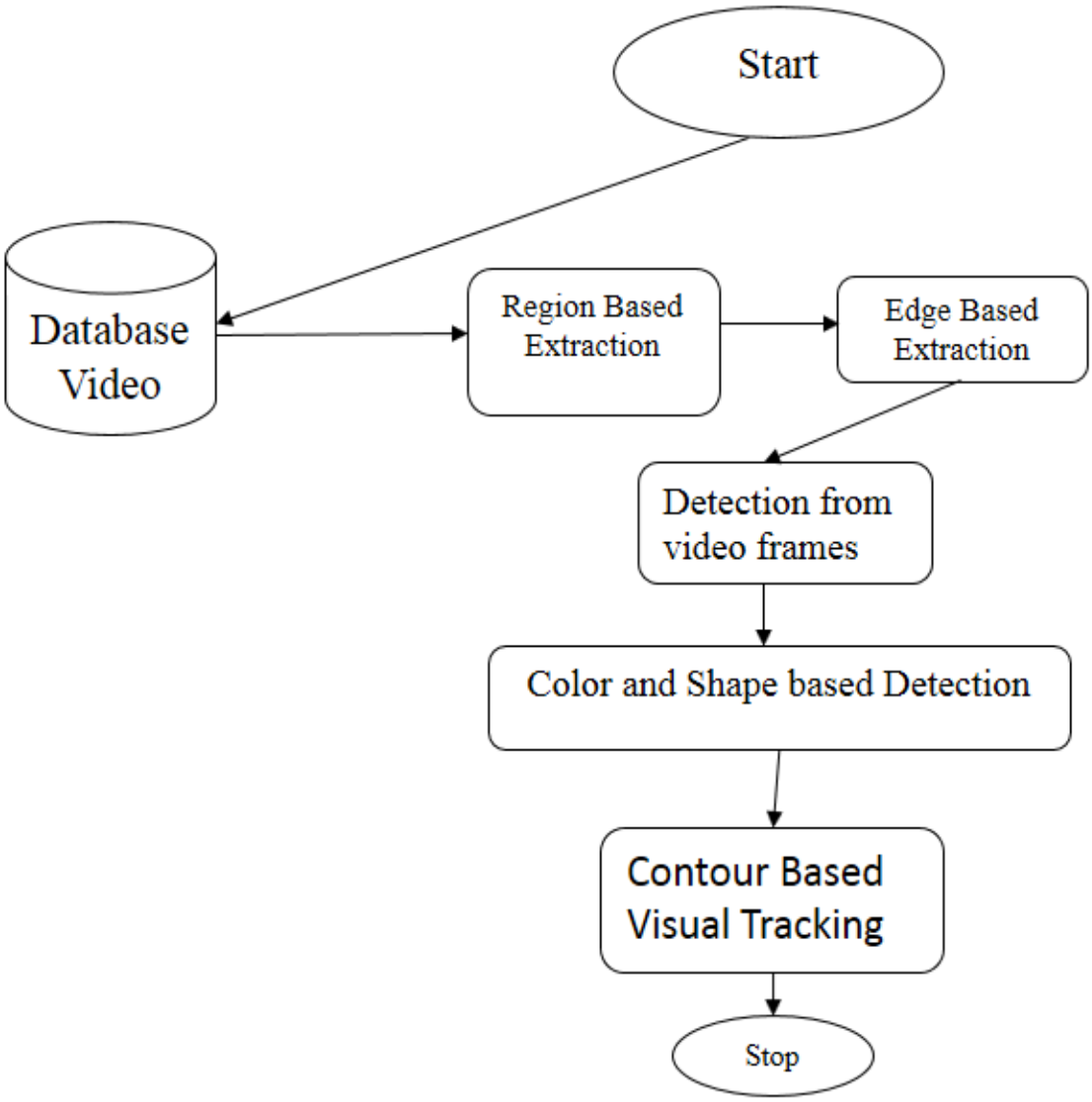
Proposes a new approach for establishing HAR in the consumer-electronics world by utilizing Color Skeleton Motion History Image (Color Skl-MHI) and Relative Joint Image (RJI) to monitor elderly people living alone. It performed using two famous public datasets of human daily activities. According to the experimental results, the proposed system outperforms other state-of-the-art methods on both datasets.HAR is an important part of establishing an intelligent health-care monitoring system, especially for allowing the elderly to live independently with a high quality of life. It is also important to establish the regularity and normal timing of activities such as taking medicines and meals to help develop guidelines and regulations. Video surveillance is another area of application-oriented HAR research. For example, video surveillance has been used in public places such as shopping centers, sports centers and transportation stations to detect suspicious people and suspicious objects. An intelligent video surveillance system has been developed that can automatically detect loitering people using the two-dimensional Random Walk Model. HAR and machine learning in general, as well as deep learning in particular, can be considered complementary areas of research. As a demonstration of this statement, a two-step labeling scheme that utilizes deep learning technology over spatial-temporal features in a

grayscale image was developed to recognize human actions in research by Baccouche. Alternatively, different approaches for handling HAR have been attempted using other types of deep learning, such as 3D-based Deep Convolutional Neural Networks (3D2CNN) and Support Vector Machine (SVM).

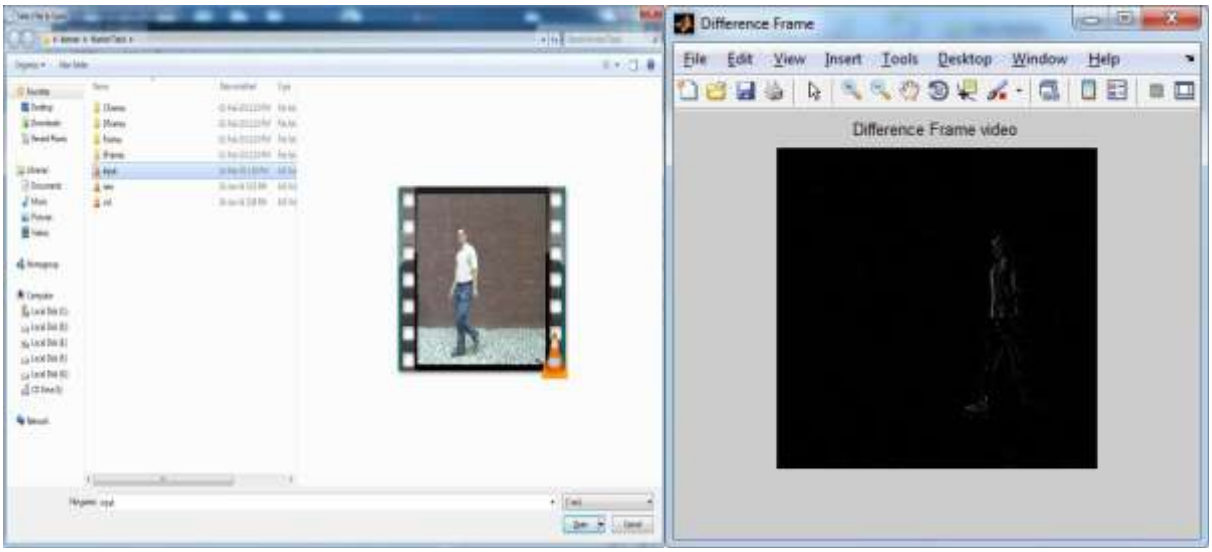
ADVANTAGES

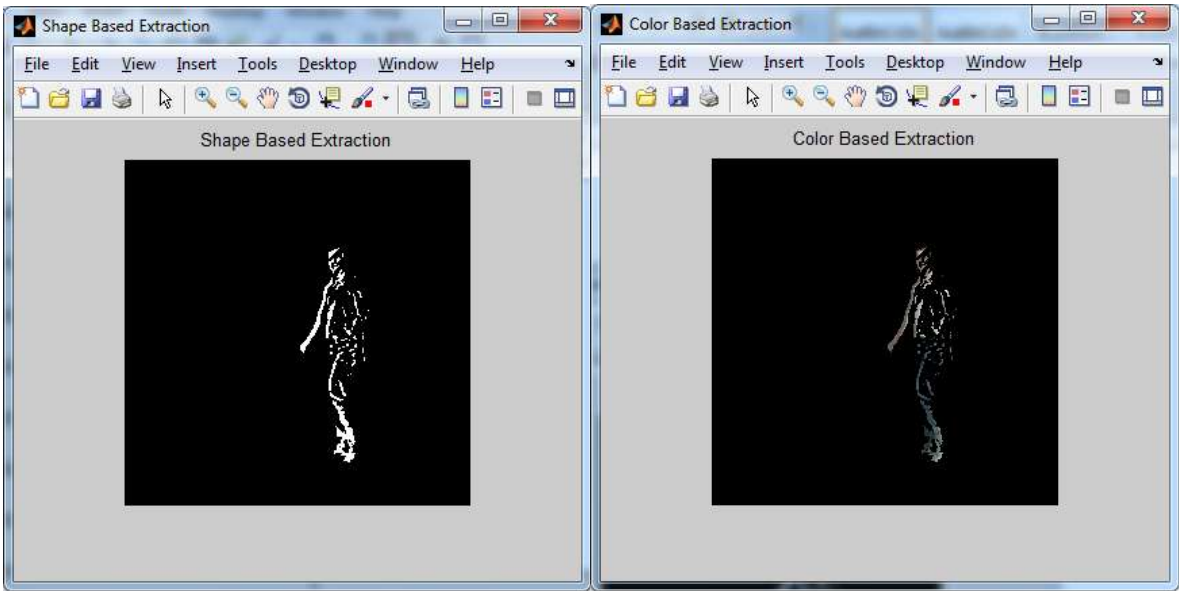
• The proposed system has low computational cost because of its use of Color Skl-MHI and RJI.
• The results are very promising for real-time applications.
• The processing time of the proposed system is evaluated based on the feature extraction time of Color Skl-MHI and RJI, as well as the classification time using 15 fps video data.

ARCHITECTURE DIAGRAM



RESULTS


Difference Frame
File Edit View Insert Tools Desktop Window Help
Difference Frame video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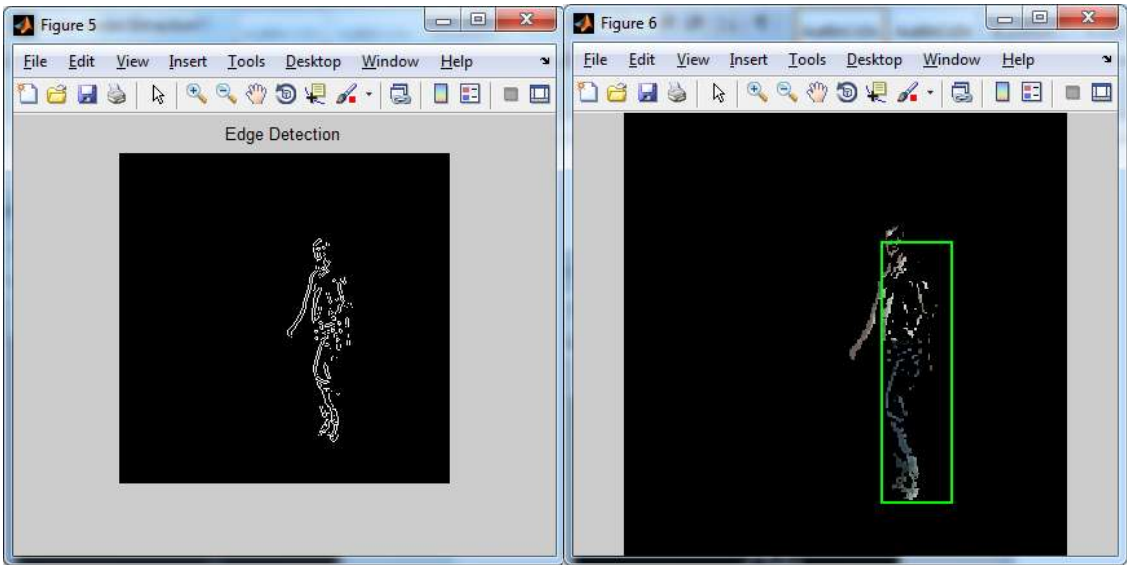

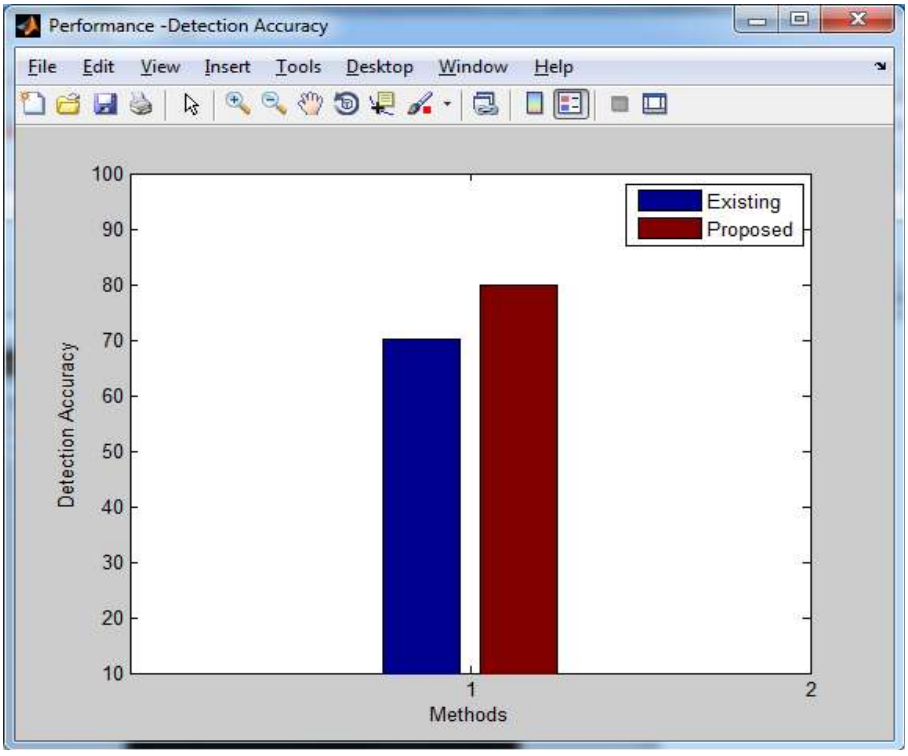

CONCLUSION

Proposed approach for locate and understand item within the scene is based on algorithm, we better the performance of item detection with the aid of choosing the strongest functions descriptor, our proposed technique it is efficaciously discover one or more gadgets in statistics set of images and calculate matching rating for item inside the scene with the aid of making use of 3 forms of thresholds and

accuracy measures are objects reputation below variable situations of rotation, partial occlusion, orientation and illumination modifications via more advantageous illumination of photo inputs. The proposed method succeeded to completely successfully detect the both moving objects in the scene independently of the luminance conditions. We showed in this paper the results obtained from the one of the used sequences that was the most convenient for the representation. The proposed algorithm, invariant to external luminance changes, has been tested under various lighting conditions, artificially simulated on the computer and with the moving object brighter and darker than the background, and satisfactory and promising results have been achieved.

REFERENCES

[1] **Sandy P. A., (2007).** *Automatic mapping and modeling of human networks", Physica A: Statistical Mechanics and its Applications*, **378** (1), 59-67, 10.1016/j.physa.2006.11.046.
[2] **N. Yugo et al**., **(2017)**, *SenStick: comprehensive sensing platform with an ultra-tiny all-in-one sensor board for IoT research Journal of Sensors*, vol. 2017,oct, p. 1-16, 10.1155/2017/6308302.
[3] **Khan Z. A. and W. Shon (2011).** *Abnormal human activity recognition system based on R-transform and kernel discriminant technique for elderly home care, IEEE Trans. Consumer Electronics*, **57**(4) 1843-1850, Nov.10.1109/TCE.2011.6131162.
[4] **Jalal A. *et al*. (2012).** *Depth video-based human activity recognition system using translation and scaling invariant features for life logging at smart home, IEEE Trans. Consumer Electronics*, **58**(3) 863-871, Sept.10.1109/TCE.2012.6311329.
[5] **Zin T. T., P. Tin and H. Hama (2017).** *Visual monitoring system for elderly people daily living activity analysis, in Proc. of the Int. MultiConf. of Engineers and Computer Scientists 2017, Hong Kong*, 15-17 Mar.40-142.
[6] **Zaineb L. *et al*., (2016).** *A Markovian-based approach for daily living activities recognition, in Proc. of the 5th Int. Conf. on Sensor Networks, Rome, Italy*, 17-19 Feb.214-219.
[7] **Wang L. H. *et al.*, (2016).** *An outdoor intelligent healthcare monitoring device for the elderly, IEEE Trans. Consumer Electronics*, **62**(2) 128-135, Jul.10.1109/TCE.2016.7514671.
[8] **Wang J. *et al*., (2014).** *An enhanced fall detection system for elderly person monitoring using consumer home networks, IEEE Trans. Consumer Electronics*, **60**(1) 23-29, Apr., 10.1109/TCE.2014.6780921.
[9] **Hung C. H. *et al*., (2012).** *Design of blood pressure measurement with a health management system for the aged, IEEE Trans. Consumer Electronics*, **58(**2). 619-625, Jul., 10.1109/TCE.2012.6227468.
[10] **Zin T. T., P. Tin, T. Toriu and H. Hama (2010).** *A Markov random walk model for loitering people detection, in Proc. of the 6th Int. Conf. on Intelligent Information Hiding and Multimedia Signal Processing, Darmstadt, Germany*, 15-17 Oct., 680-683.
[11] **Zin T. T., P. Tin, H. Hama and T. Toriu (2011).** *Unattended object intelligent analyzer for consumer video surveillance, IEEE Trans. Consumer Electronics*, **57**(2) 549-557, Jul., 10.1109/TCE.2011.5955191.
[12] **Moez B. *et al*., (2011).** *Sequential deep learning for human action recognition, in Proc. of the Int. Workshop on Human Behavior Understanding, Amsterdam, Netherlands*, 16 Nov., 29-39.
[13] **Zhi L. *et al*., (2016).** *3D-based deep convolutional neural network for action recognition with depth sequences, Image and Vision Computing*, **55(**2) 93-100, Nov., 10.1016/j.imavis.2016.04.004.