

# Designing and Implementation of Gaming Using Eye

Vaishnavi kanumalla<sup>1</sup>, Shilpa Kundu<sup>1</sup>, Shraddha kale<sup>1</sup>, Vedanti Bobde<sup>1</sup>, Omesh Kalambe<sup>2</sup>

<sup>1</sup>UG Student, <sup>2</sup> Assistant Professor,  
Department of Computer Science Engineering,  
G.H.Raisoni Institute of Engineering and Technology, Nagpur, India.

**Abstract** -Game theory (GT) is a mathematical method that describes the phenomenon of conflict and cooperation between intelligent rational decision-makers. In particular, the theory has been proven very useful in the design of wireless sensor networks (WSNs). This article surveys the recent developments and findings of GT, its applications in WSNs, and provides the community a general view of this vibrant research area. We first introduce the typical formulation of GT in the WSN application domain. The roles of GT are described that include routing protocol design, topology control, power control and energy saving, packet forwarding, data collection, spectrum allocation, bandwidth allocation, quality of service control, coverage optimization, WSN security, and other sensor management tasks. Then, three variations of game theory are described, namely, the cooperative, non-cooperative, and repeated schemes. Finally, existing problems and future trends are identified for researchers and engineers in the field.

**Keywords:** wireless sensor network; game theory; scheduling; optimization; mechanism

## 1. Introduction

### 1.1. Wireless Sensor Networks

A wireless sensor network (WSN) is a network of thousands of resource-constrained sensors whose communications with a central station are conveyed by means of wireless signals. A sensor node is generally comprised of four basic elements, including a sensing unit, a processing unit, a transceiver unit, and a power

unit. The WSN is frequently deployed for sensing the area of interest where data captured encompass light, pressure, sound, and others. Sensor nodes in WSN mainly use a broadcast communication paradigm where the sensor signals are used in further analyses of the sensed environment. WSN is preferred as the sensor system architecture with regard to its inherent redundancy but is susceptible to disadvantages caused by limited operation life-time. Differ from other wired networks, the use of WSNs are usually restricted by energy stored, computation capability, memory, plethoric information flow, and short communication distance [1]. Since the sensor nodes are often densely deployed in a sensing field, it is difficult and costly to replace faulty sensor nodes manually. Furthermore, sensor nodes may have no global information of the whole network and the topology of a WSN varies frequently [2,3].

### 1.2. Application Examples

With the high degree of deployment flexibility, applications of WSN are vast and can be broadly classified into the monitoring and tracking categories. Monitoring applications include environmental monitoring such as forest fire detection, biocomplexity mapping of the environment, flood detection, precision agriculture; health monitoring contains tele-monitoring of human physiological data, monitoring doctors and patients conditions and drug administration in hospitals; inventory location monitoring; factory, machine, chemical and structural monitoring. Military monitoring examples can be found in monitoring friendly forces, equipment and ammunition, battlefield and terrain surveillance,

reconnaissance of opposing forces, targeting, battle damage assessment, nuclear, biological and chemical attack detection. Tracking applications include objects, animals, humans, vehicles, and military enemy tracking. These applications are made possible due to the fact that WSN has a short system setup time and sensors can be disposed with acceptable operation cost.

### 1.3. Need for Game Theory

The flexibility, fault tolerance, high sensing fidelity, low-cost and rapid deployment characteristics of WSNs are desirable features in creating many new and exciting application areas for remote sensing, detecting, tracking, and monitoring. However, it is non-trivial and very involved to design an optimal WSN to satisfy performance objectives such as maximum sensing coverage and extended operation periods. In order to obtain a practical and feasible WSN and due to the operation nature of the network, game theory (GT) is regarded as an attractive and suitable basis to accomplish the design goal. Game theory is a branch of mathematics and can be used to analyze system operations in decentralized and self-organizing networks. GT describes the behavior of players in a game. Players may be either cooperate or non-cooperative while striving to maximize their outcomes from the game. In this regard, sensors manage their operations in terms of power resources devoted to sensing and communicating among

themselves and with a global controller such that the assigned task could be completed effectively as desired [5].

### 1.4. Motivation

With the rapid development in electronics and wireless technology, WSN will certainly find more and more application when the need for environment sensing arises. On the other hand, the developments of WSN theory and systems have received a lot of attention in both the industry sector and research community. Among many alternative approaches, GT has been increasingly applied in the design of WSNs, thus, the scope of this paper is restricted to the use of GT for WSNs.

From 2003 to 2011, about 330 research papers with topics on or closely related to GT for WSN were published. The number of records for 2011 is not complete because some publications have not been included in the indexing databases. A relatively smaller portion of the contributions in this area has been summarized in [5.6]. Machado and Tekinay [5] reviewed 29 publications which mainly focusing on the use of game-theoretic approaches to formulate problems related to security and energy efficiency. Shen *et al.* [6] summarized 30 publications of the existing game theoretical approaches that are designed to strengthen WSN security.

### LITREATURE REVIEW:

TITLE	AUTHOR	YEAR	TECHNIQUE
<b>1. Gesture-Based Affective and Cognitive States Recognition Using Kinect for Effective Feedback during e-Learning</b>	<u>Kartik Vermun</u> <u>Mohit Senapaty</u>	18-20 Dec. 2013	<u>Databases, Gesture recognition, Electronic learning, Computers, Head, Context</u>
<b>2. An HMM-based eye movement detection system using EEG brain-computer interface</b>	<u>Chi-Hsuan Hsieh</u> <u>Hao-Ping Chu</u>	1-5 June 2014	<u>Electroencephalography, Hidden Markov models, Complexity theory, Viterbi algorithm, Brain modeling, Real-time systems, Games</u>
<b>3. Gaming controlling via brain-computer interface using multiple physiological signals</b>	<u>Shi-An Chen</u> <u>Chih-Hao Chen</u>	5-8 Oct. 2014	<u>Electrooculography, Electroencephalography, Feature extraction, Wireless communication, Games, Signal processing algorithms, Sports equipment</u>
<b>4. Eye gaze direction detection using Principal Component Analysis and appearance based methods</b>	<u>Çağatay Murat Yılmaz</u> <u>Cemal Köse</u>	16-19 May 2015	<u>Principal component analysis, Computers, Accuracy, Estimation, Human computer interaction, Feature extraction, Artificial neural networks</u>

## PROPOSED APPROACH

Our basic study of the Daugman's mathematical algorithms for iris method, derived from the information found at intervals the open literature, diode U.S. to suggest some potential ways that [2]. Iris recognition technology works by combining laptop vision, pattern recognition, and optics. First, a black-and-white video camera zooms in on the iris and records a sharp image of it. The iris is lit by a low-level light-weight to assist the camera in focusing. A frame from this video is then digitized into a 512 computer hardware unit file and hold on on a electronic info service.

There square measure three main stages in iris recognition system

- Image preprocessing
- Feature Extraction
- Template Matching

In this paper we've got an inclination to use rough work for localization and segmentation of iris image. Dougmans rubber sheet model for iris standardization. For feature extraction we've got an inclination to square measure exploitation three distinct algorithms i.e. zero-crossing one D riffle man of science No., and genetic formula. The score base fusion approach is used to make a judgment of acceptive or rejecting the user.

The paper is organized as follows: section a combine of describes the image preprocessing exploitation Hough work and iris standardization exploitation Dougmans rubber sheet model. Section 3 explains the feature extraction exploitation zero-crossing one D riffle man of science No., and genetic formula. Section four describes relating to guide matching exploitation performing arts distance. Section 5 projected the score standardization and fusion techniques. Section cardinal summarizes the paper.

### 2. Image Preprocessing

The iris image should be preprocessed to urge useful iris region. Image preprocessing is split into three steps:

- Iris localization
- Iris standardization  Image sweetening.

#### 2.1 Iris Localization

Iris localization detects the inner and outer boundaries of the iris. every the inner and outer iris boundaries could also be concerning sculptured as circles. the center of iris

does not primarily coaxial with the center of pupil. Iris localization is important as a results of correct iris region is needed to urge the templates for proper matching. The eyelids and eyelashes ordinarily block the upper and lower parts of the iris region. Also, mirror like reflections can occur among the iris region corrupting the iris pattern. a technique is required to isolate and exclude these artifacts equally as locating the circular iris region as shown in figure a combine of. we tend to use Hough work for localization and segmentation of the iris.

#### 2.1.1 Hough work

The Hough work may well be a standard laptop vision formula which is able to be accustomed verify the parameters of simple geometric objects, like lines and circles, gift in an exceedingly image. The circular Hough work could also be accustomed deduce the radius and center coordinates of the pupil and iris regions. associate automatic segmentation formula supported the circular Hough work is employed by Wildes et al. [10], Kong and Zhang [11]. Firstly, a grip map is generated by conniving the first derivaties of intensity values in an exceedingly watch image thus thresholding the result. From the sting map, votes square measure cast in Hough space for the parameters of circles passing through each edge purpose. These parameters square measure the center coordinates  $x_c$  and  $y_c$ , and conjointly the radius  $r$ , that ar able to define any circle in line with the equation  $x_c^2 + y_c^2 - r^2$

A most purpose at intervals the Hough space will correspond to the radius and center coordinates of the circle best made public by the sting points. Wildes et al. and Kong and Zhang jointly produce use of the parabolic Hough work to seek out the eyelids, approximating the upper and lower eyelids with parabolic arcs, that ar pictured as;

$(-(x-h_j)\sin \theta_j + (y-k_j) \cos \theta_j)^2 = a_j((x-h_j)\cos \theta_j + (y-k_j)\sin \theta_j)^2$  mass. (1) where  $a_j$  controls the curvature,  $(h_j, k_j)$  is the peak of the plane figure and  $\theta_j$  is that the angle of rotation relative to the axis. In activity the preceding edge detection step, Wildes et al. bias the derivatives at intervals the horizontal direction for detecting the eyelids, and at intervals the vertical direction for detecting the outer circular boundary of the iris. The motivation for usually{this can be} often that the eyelids square measure generally horizontally aligned, and jointly the flap edge map will corrupt the circular iris boundary edge map if

exploitation all gradient info [12]. Taking exclusively the vertical gradients for locating the iris boundary will reduce influence of the eyelids once activity circular Hough work, and not all of the sting pixels method the circle square measure required for productive localization. Not exclusively can this produce circle localization plenty of correct, it jointly makes it plenty of economical, since there square measure less edge points to cast votes at intervals the Hough space.

#### Feature Extraction

In order to produce correct recognition of people, the foremost discriminating info gift in associate degree iris pattern should be extracted. solely the numerous options of the iris should be encoded in order that comparisons between templates will be created. Most iris recognition systems create use of a band pass decomposition of the iris image to make a biometric example [13].

The example that's generated within the feature cryptography method will would like a corresponding matching metric, which supplies a live of similarity between 2 iris templates. This metric ought to offer one vary of values once comparison templates generated from a similar eye, called intra-class comparisons, and another vary of values once comparison templates created from totally different irises, called inter-class comparisons. These 2 cases ought to offer distinct and separate values, in order that a call will be created with high confidence on whether or not 2 templates square measure from a similar iris, or from 2 totally different irises.

Feature extraction may be a special kind of spatiality reduction. once the information|input file| computer file} is simply too massive to be processed and it's suspected to be notoriously redundant (much data, however not abundant information) then the input file are remodeled

into a reduced illustration set of options. For the aim of feature extraction we are going to be remodeling into a reduced illustration set of options is named feature extraction exploitation the subsequent 3 algorithms • Zero crossing based mostly 1-D rippling

- Genetic algorithmic rule
- Euler No.

#### CONCLUSION AND FUTURE WORK

The non-public identification approaches victimization iris pictures area unit receiving increasing attention within the bioscience literature. many strategies are given within the literature and people supported the part encryption of texture data area unit prompt to be the foremost promising. However, there has not been any commit to mix these approaches to attain any improvement within the performance. This paper presents a multialgorithmic fusion approach for iris recognition which mixes the result obtained from several 3 algorithms particularly Zero crossing primarily based 1D moving ridge, Genetic formula and mathematician No., attributable to their benefits the combined approach would conceal the issues within the method of feature extraction victimization single methodology and would increase the iris recognition performance. .In future we'll attempt to mix a lot of economical options extraction formula to induce higher potency and accuracy in iris recognition. conjointly we'll attempt to fuse 2 or a lot of modalities, like iris and fingerprint, to boost the performance over the unimodal systems.

## REFERENCES

- [1] K.W.Bowyer, K.Hollingsworth, and P.J.Flynn, "Image Understanding for Iris Biometric: A Survey," *Computer Vision Image Understanding, IEEE Transaction*, 2008, DOI:10.1016.CVIU.2007.08.005.
- [2] J. G. Daugman, "High Confidence Visual Recognition of Persons by a Test of Statistical Independence", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol.15, No. 11, pp. 1148–1161, 1993.
- [3] Richard Yew Fatt Ng, Yong Hour Tay, Kai Ming Mok, "A Review of Iris Recognition Algorithm", DOI: 978-1-4244-2328-6/08.
- [4] L.Xu, A. Kryzak, C.Y.Suen, "Methods Of Combining Multiple Classifiers And Their Approach To Handwriting Recognition", *IEEE Transaction on System, Man and Cyber*, Vol. 22, No. 3, pp. 418-435, 1992.
- [5] R. Brunelli, D. Falavigna, "Person Identification Using Multiple cues", *IEEE, Transaction on Pattern Analysis and Multiple Intelligence*, Vol. 17, No. 10, pp. 995-966, 1995.
- [6] E. Bigun, J. Bigun, B. Due, S. Fisher, "Expert Conciliation for Multiple Person Authentication Sytem by Bayesian Statistics", *Proceeding of the First Audio and Video based Person Authentication, AVBPA 97*, pp. 327-334, Ed. Springer Verlag, 1997.
- [7] L. Hong, A.K.Jain, "Intelligent Faces and Fingerprints for Personal Identification", *IEEE, Transaction on Pattern Analysis and Multiple Intelligence*, Vol. 20, No. 12, pp. 1295-1307, 1998.
- [8] Hanene Trichili, Feten Besbes and Basel Solaiman, "Multimodal Biometric Systems based on Fingerprint Identification and Iris Recognition", *IEEE Transaction on Image Processing*, Vol.5, pp. 947-952, 2006.
- [9] Teddy Ko, "Multimodal Biometric Identification for Large User Population Using Fingerprint, Face And Iris Recognition" *IEEE Computer Society*, Vol. 24, pp. 1164-1175, 2006.
- [10] Chinese Academy of Sciences – Institute of Automation. Database of 756 Greyscale Eye Images. <http://www.sinobiometrics.com> Version 1.0, pp. 548-557, 2003.
- [11] P. Burt, E. Adelson. "The Laplacian Pyramid As A Compact Image Code", *IEEE Transactions on Communications*, Vol. COM-31, No. 4, 1983.
- [12] Wai-Kin Kong & David Zhang "Detecing Eyelash and Reflection for Accurate Iris Segmentation" *Proceedings of 2005 International Symposium on Intelligent Multimedia, Video and Speech Processing*, Vol. 8, pp. 897-906, 2005.
- [13] R. P. Wildes, "Iris Recognition: An Emerging Biometric Technology", *Proceedings of the IEEE*, Vol. 85, No. 9, pp. 1348-1363, 1999.
- [14] W. W. Boles and B. Boashash, "A Human Identification Technique Using Images of the Iris and Wavelet Transform", *IEEE Transactions on Signal Processing*, Vol. 46, No. 4, pp. 1185-1188, 1998.
- [15] S. Mallat, "Zero-Crossings Of The Wavelet Transform," *IEEE Transaction on Information. Theory*, Vol. 37, No. 4, pp. 1019-1033, 1992.
- [16] W.W.Boles, and B.Boashash, "A Human Identification Techniques Using Images of The Iris and Wavelet Transform", *IEEE Transactions on Signal Processing*, Vol. 46, No. 4 , pp. 1185-1188, 1998.
- [17] C. Sanchez-Avila, R. Sanchez-Reillo, and D. de Martin-Roche, "Iris based biometric recognition using dyadic wavelet transform," *IEEE Aerospace Electronics System and Magagement*, Vol.17, pp.3-6, 2002.
- [18] M. Vatsa, R.Singh, A. Noore, "Improving Iris recognition performance using segmentation, quality enhancement, match score fusion, and Indexing", *IEEE Transaction on systems, man, and cybernetics-part B: Cybernetics*, Vol. 38, No.4, pp. 1048-1056, 2008.