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Theory of Object Detection and Analysis Review Work

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Abstract: With problem of rapid technology in field of complex object detection, we need a better way and pay more attention in case of object recognition and result optimization. In this review work we put two perspective methods to explain the mechanism of concealed object detection these two methods focus on (1)support vector machine (2) and hoteling transform algorithm which corresponding on how the plain and complex target can be clustering then detecting using algorithms of image processing analysis. Beside That algorithms a tiny processes can work to align the main algorithm to create a comfortable environment, such as support vector machine, Zernike moments and many others whereas play an important role in image processing domain, which give a review work more confident to the researchers and reader before going to do them research.

Keywords: Complex object, Ant Colony Optimizations, hoteling, support vector machine, hybrid algorithm mechanism.

I. INTRODUCTION

Algorithm review is a practical and alternative methods to detect and determine the error and attempting to enhance the weak point in this algorithm by using the pre-algorithms more effective and comfortable for present work [1]. The systematic process pushing the authors to find out how to develop the algorithm and make it more sophisticated to any offers project. [2] In this review work we are trying to find out and explain the hybrid support vector machine, hoteling and other sub-main supporting algorithm such as Zernike moments and so on, we choose SVM algorithm and Hoteling algorithm to use as a goal or targeting to explain the important algorithms in object detection and object recognition whereas both algorithms support the verification and validation for both detect and recognition [3]. The main framework of our review paper talking about the specific work and details of both algorithms and prescribe the procedure of it based on previous work and how detect and recognize algorithms which is playing important role in object finding details[4]. Roberto A. REYNA and Michel CATTOEN explain good result of support vector machine algorithm by using pattern recognition of block pixels by mapping method which mean doing a vector input x dimensional of space z [5].the researchers Aditya V. Padakiy and Koshy Georgez working with SVM novelty to them research work, whereas design SVM can splitting the target in radar even there is embedded noise attack the target in case if echo device very weak [6].

II. SUPPORT VECTOR MACHINE WITH PATTERN RECOGNITION

Once significant features are extracted from fused image, a good classification technique is implemented to identify the suspicious object with in comparison to a reference target. This aids the security personnel in identifying and taking appropriate response in case of any threat perceived [7]. The SVM is a pattern recognition algorithm which is regarded as the most powerful tool in the object identification. The feature vector is classified by using the support vector machine into two classes of object detected and No object detected [8]. The Bellow block diagram explain how the SVM algorithm working and detect the target.

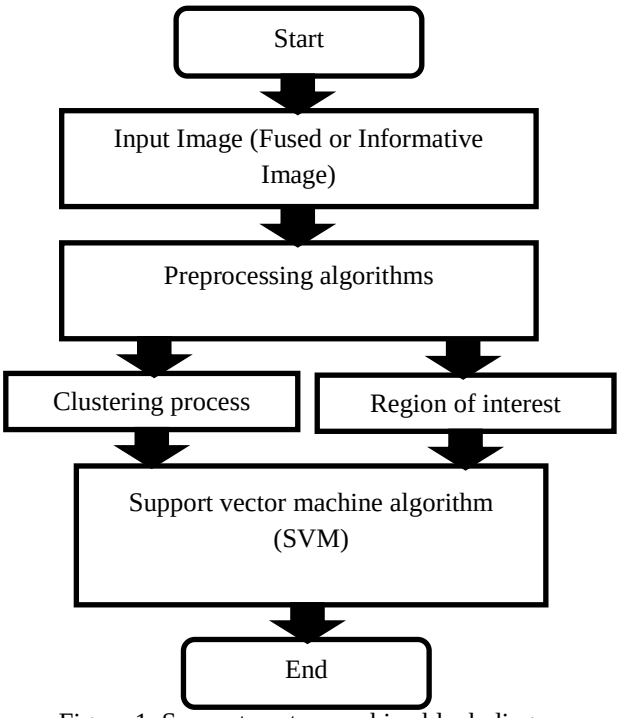

Figure.1. Support vector machine block diagram.

III. HOTELING ALGORITHM

The Hoteling transform is a dimensionality reduction algorithm which involves a mathematical procedure that transforms a number of correlated variables into a number of uncorrelated variables. It computes a compact and optimal description of the image data set. This algorithm is also called as Karhunen Loeve transform [9]. The first principal component contains the main and most of the information of the original image after the transformation, and the surplus main information assigned to the second component, the rest may be deduced by analogy. First principal component is taken to be along the direction with the strongest correlation that is the most variance almost 90 percent of the original image. The second principal component is constrained to lie in the subspace perpendicular of the first.

IV. ANT COLONY OPTIMIZATIONS

Ant Colony Optimization is an evolutionary approach based on colony aptitude finding wider range of applications. It is inspired by the natural behavior of the ant species wherein the ants deposit Pheromone (a chemical released by the ants) on the ground for foraging in order to mark the shortest distance and most favorable path that should be followed by other members of the ant colony system. This ACO algorithm is an optimization technique based on mathematical equations that finds minima and maxima of functions, subject to so called constraints[11] [12]. ACO was first proposed by Dorigo. The proposed approach is to deposit a number of ants, which move on the image driven by the image intensity value variations, to establish a pheromone matrix, which represents the edge information at each pixel location of the image. Edge is a boundary between two homogeneous regions [13]. Image segmentation based on edge detection subdivides an image into its constituents regions which are more meaningful and easier to analyze for further computations.

V. CONCLUSION

This review paper explain and present the advantage of using hybrid algorithm in object recognition and detection. It has shown also those two algorithms SVM and Hoteling working together to find out the minimum error of object detection the two algorithm models had been using in many previous result papers and provide us accuracy result. The review paper has been carried out by researcher to explain the benefit of those algorithms, this review paper has different from other papers by the details of both SVM and Hoteling algorithm.

REFERENCES

[1]. Jianping Yao" An Introduction to Three Perspectives on Formal Specification Review"10th IEEE International Conference on Engineering of Complex Computer Systems.
[2]. Yuting Chen, Shaoying Liu, and Fumiko Nagoya"a Framework for SOFL-based Program Review 10th IEEE International Conference on Engineering of Complex Computer Systems.
[3]. Haritha. T and Rajesh Kannan Megalingam" Multiple-Instance Learning Support Vector Machine Algorithm based Pedestrian Detection" International Conference on Communication and Signal Processing, July 28 - 30, 2020, India.
[4]. Yunda Sun Ming Li Wei Wu et.al "Background Model Initialization in Moving Object Detection with Shadow Elimination "ICSP'O4 Proceedings IEEE 2004.
[5]. Roberto A. REYNA and Michel CATTOEN" Segmenting Images with Support Vector Machines" 2000 IEEE.
[6]. Aditya V. Padakiy and Koshy Georgez" A Novel Application of Support Vector Machines to Detect Targets" Second International Conference on Computational Intelligence, Modelling and Simulation2010.
[7]. Yingjie Fu, Dazhong Ma, Huaguang Zhang, Li Zheng" Moving Object Recognition Based on SVM and Binary Decision Tree" 2017 IEEE 6th Data Driven Control and Learning Systems Conference May 26-27, 2017, Chongqing, China.
[8]. C. Szegedy, V. Vanhoucke, S. Ioffe, et al, Rethinking the inception architecture for computer vision, in Proceedings of the IEEE Conference on Computer Vision and Pattern
[9]. Recognition, 2016: 2818–2826.
[10]. Shreenandan Kumar1, Suman Kumari1, Sucheta Patro1" Adaptive Visual Tracking on Euclidean Space Using PCA" 2015 International Conference on Advances in Computing, Communications and Informatics (ICACCI).
[11]. A. Rebhi, S. Abid, F. Fnaiech" Texture defect detection method based on H-image and Hotteling model T2" 1st International Conference on Advanced Technologies for Signal and Image Processing - ATSIP'2014 March 17-19, 2014, Sousse, Tunisia.
[12]. Udit Kumar, Sumit Soman and Jayadeva" EigenAnt assisted IACOR for continuous global optimization" 2016 IEEE International Conference on Systems, Man, and Cybernetics • SMC 2016 October 9-12, 2016 • Budapest, Hungary.
[13]. Xiao-Min Hu" SamACO: Variable Sampling Ant Colony Optimization Algorithm for Continuous Optimization" IEEE TRANSACTIONS ON SYSTEMS, MAN, AND CYBERNETICS—PART B: CYBERNETICS, VOL. 40, NO. 6, DECEMBER 2010.
[14]. Jing Xiao and LiangPing Li. "A hybrid ant colony optimization for continuous domains". Expert Systems with Applications, 38(9):11072– 11077, 2011.