IJCSE International Journal of Computer Sciences and Engineering Open Access
Review Paper Vol.-6, Issue-11, Nov 2018 E-ISSN: 2347-2693

A Review On Exploring Online Ad Images Using A Clustering Approach

Krushil Bhadani[1*], Bijal Talati [2]

[1, 2] Computer Engineering Department, Sardar Vallabhbhai Patel Institute of Technology, Vasad, Gujarat, India

Available online at: www.ijcseonline.org

Accepted: 21/Nov/2018, Published: 30/Nov/2018

***Abstract*—** Online advertising is a huge, rapidly growing advertising market in today's world. One common form of online advertising is using image ads. A decision is made (often in real time) every time a user sees an ad, and the advertiser is eager to determine the best ad to display. Consequently, many algorithms have been developed that calculate the optimal ad to show to the current user at the present time. Typically, these algorithms focus on variations of the ad, optimizing among different properties such as background color, image size, or set of images but none of them define the property of objects. Our study looks at new qualities of ads that can be determined before an ad is shown (rather than online optimization) and defines which ad image's objects are most likely to be successful. We present a set of algorithms that utilize machine learning to investigate online advertising and to construct object detection models which can foresee objects that are likely to be in successive ad image. The focus of results is to get high success rate in ad image with objects appear in it. In this paper we are finding the best classifier among the all.

***Keywords*—** Object Detection, Machine Learning, And Prediction Model.

I. INTRODUCTION

Online advertisement is one of the largest advertisement markets in the world, and it has grown rapidly in recent year. Now a day the investor prefer online system for their advertisement. According to ComScore, about 5.3 trillion display ads were delivered in the U.S. throughout 2012. Magna Global predicts that by 2017 online ad revenue will reach 72 billion dollars. And here one of the form of ad image is web banners (also referred to as banner ads) in which ads are embedded into web pages as static images. Forrester forecasts that by 2019 U.S. advertisers will spend over 100 billion dollars on digital advertising, while TV advertising to be only 90 billion dollars. One of online advertisement is web banner in which ads are embedded into web pages as static images. This banner are mean to attract people for promoting the websites and engage with ads. By clicking on the ads and redirected to the promoting website [1].

Scenes are composed of objects and their surrounding environment, both of which should be useful for a vision system to recognize the type of scene. In ad image there are lots of object and content that represent the promotional content based on that content we are going to propose the work. Here we are mentioning the different type of classifier methods and object detection methods for image classification.

Figure 1. Different ad image

Section I contains the introduction of basic approach for weather forecasting. II contain the related works of basic literature papers. Section III contain the methodology and algorithms section IV explain the comparative study between different algorithms and at last conclusion and future scope.

II. RELATED WORK

Jinsu Lee, Junseong Bang, and Seong-Il Yang (2017) proposed Object Detection with Sliding Window in Images Including Multiple Similar Objects. In this paper, the feature matching method with a sliding window is proposed to detect an object of interest in an image including a lot of similar objects. Here they mention first step as selection of dataset for images than image processing as sliding window method [2].

Meera M K and Shajee Mohan B S (2016) proposed Object Recognition in Images. In this paper the proposed method explains the implementation of an object recognition system. Here they mention extraction and classification methods. GIST and SIFT (scale invariant feature transform) are feature base method, SVM and KNN are classification methods are used [3].

Jie Sheng Tham, Yoong Choon Chang and Mohammad Faizal Ahmad Fauzi (2016) proposed Object Recognition using Depth Information of a Consumer Depth Camera. It consists of six steps: 1) depth image acquisition using a Kinect sensor, 2) background subtraction to extract object depth image, 3) histogram modelling for further analysis for object recognition, 4) redundant information removal from the histogram pattern obtained, 5) noise reduction to enhance the image quality, and finally 6) object detection for proposed method. Here they mention the method of object detection is Ambient Assisted Living (AAL) [4].

Kyung‐Mo Koo and Eui‐Young Cha (2017) proposed Image recognition performance enhancements using image normalization. In this paper they propose a technique to improve the recognition performance using the pre-processing process that detects the distinguishable features of each product and normalizes them, with the aim of recognizing the manufacturer and the product name of the electronic product. As mention they take normalization method for object detection [5].

Hideaki Yanagisawa, Takuro Yamashita and Hiroshi Watanabe (2018) proposed A Study on Object Detection Method from Manga Images using CNN. In this paper they detect object in Japanese comics (manga) by using object detection and classifier. They use methods like CNN, Fast R-CNN, Faster R-CNN and SSD [6].

Dr. R.Muralidharan (2014) proposed Object Recognition Using K-Nearest Neighbour Supported by Eigen Value Generated from the Features of an Image. Here they mention in paper, an object recognition system is proposed, that provides the best way to recognize the object from the given image. The methods are Canny Edge Detection for object detection and Nearest Neighbour classifier [7].

III. METHODOLOGY

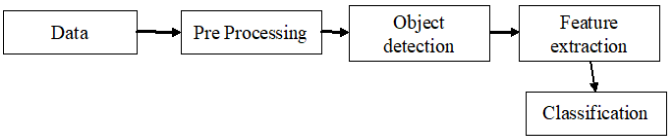

Figure 2. Basic Steps

A. *Object Feature*

Three type of feature extraction techniques.

i. Shape: Shape feature is some set of numbers that are produced to describe a given shape. A descriptor attempts to quantify shape in ways that agree with human intuition (or task-specific requirements). Good retrieval accuracy requires a shape descriptor to be able to effectively find perceptually similar shapes from a train machine [11].

ii. Color: Color feature is based on property of object. For more accuracy in result we are finding the color property of that object. In base paper there is only relation between object category is given and based on that property k nearest algorithm is applied. Now in proposed system we are going to represent the feature based k nearest algorithm for more accuracy in our result. There are methods like color histogram, histogram intersection and so on [12].

iii. Texture: The texture features extracted by local binary pattern, complete local binary pattern, Gabor feature, gray level Co-occurrence Matrix (GLCM) and local ternary pattern. The Local Binary Pattern is a great device to depict the neighborhood traits of a texture. LBP's are computationally proficient and basic nonparametric neighborhood picture texture descriptor. Complete Local Binary Pattern is an element which thinks about both sign (S) and magnitude (M) and focus intensity level (C). The GLCM (Gray Level Co-occurrence Matrix) will be utilized to extracting four measurable composition Parameters i.e., Inverse Difference Moment, Entropy, Correlation and Angular Second Moment. GF (Gabor highlights) is utilized for some, reason like surface examination and division and so on. Subsequent to finding the parameters of each filter, process the convolution of each filter and picture, the mean and standard deviation of the each filtered picture and native picture.

B. *Object detection*

Here we are representing cascading detection method. The cascade object detector uses the Viola-Jones algorithm to detect people's faces, noses, eyes, mouth, or upper body. You can also use the Image Labeler to train a custom classifier to use with this System object [13].

Classification Model Training: Each model is trained to detect a specific type of object. The classification models are trained by extracting features from a set of known images. These extracted features are then fed into a learning algorithm to train the classification model. Computer Vision System Toolbox™ software uses the Viola-Jones cascade object detector. This detector uses HOG, LBP, and Haar-like features and a cascade of classifiers trained using boosting. The image size used to train the classifiers defines the smallest region containing the object. Training image sizes vary according to the application, type of target object, and available positive images. You must set the MinSize property to a value greater than or equal to the image size used to train the model [13].

Cascade of Classifiers: This object uses a cascade of classifiers to efficiently process image regions for the presence of a target object. Each stage in the cascade applies increasingly more complex binary classifiers, which allows

the algorithm to rapidly reject regions that do not contain the target. If the desired object is not found at any stage in the cascade, the detector immediately rejects the region and processing is terminated. By terminating, the object avoids invoking computation-intensive classifiers further down the cascade [13].

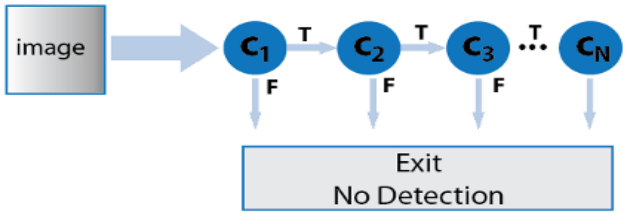

Figure 3. Cascading classifier

Merge Detection Threshold: For each increment in scale, the search window traverses over the image producing multiple detections around the target object. The multiple detections are merged into one bounding box per target object. You can use the Merge Threshold property to control the number of detections required before combining or rejecting the detections. The size of the final bounding box is an average of the sizes of the bounding boxes for the individual detections and lies between MinSize and MaxSize [13].

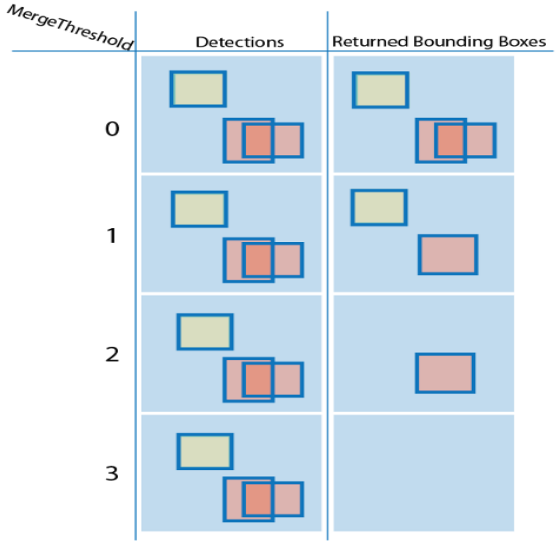

Figure 4. Merge detection method

C. Object Classification

i. **ANN:** Artificial Neural Network (ANN) is used to process feature rich data. ANN is also extensively used as classifier for analyzing the EEG signals.

ii. KNN: K-nearest neighbor (KNN) is capable to produce high performance results even for complex applications. The KNN uses a distance of features in a data set to determine which data belongs to which group. A group is formed when the distance within the data is close while many groups are formed when the distance within the data is far.

iii. SVM: Support vector machine is supervised learning models. It is a kind of learning algorithm which is used to analyze the data and recognize the data patterns. It is mainly applicable for solving the binary problems.

iv. R-F: It is operated by constructing a multitude of decision trees at training time and outputting the class that is the mode of the classes (classification) or mean prediction (regression) of the individual trees. Random decision forests correct for decision trees' habit of over fitting to their training set.

IV. COMPARATIVE STUDY

TABLE I. COMPARISON BETWEEN OBJECT DTECTION METHOD

Detection method	Advantage	Limitation
ORB(Oriented FAST and Rotated BRIEF) Detector[2]	Rotation invariant resistant to noise	we have not adequately addressed here is scale invariance
SIFT(Scale Invariant Feature Transform) feature + kNN classifier GIST feature + SVM classifier[3]	GIST+SVM have high accuracy over 'Coil20p and Eth80' dataset.	GIST and SIFT feature are extracted and based on block size so increase the computational power
Image Normalization[5]	Here they get highest accuracy for home appliances.	Rotation invariance is not suitable.
SSD(Single Shot MultiBox Detector)[6]	Detection accuracy of SSD is improved by dividing image into blocks.	SSD cannot detect some objects.
Moment invariant[8]	Gets the 80% accuracy Considering the depth object recognition Invariant to translation, scaling and rotation.	Only One object can be trained Object size should be not considered

TABLE I. COMPARISON CLASSIFICATION METHOD

Classifier	Advantage	Limitation
Support Vector Machine	SVM is less complex. Produce extremely precise classifiers. Use for Robust to noise.	SVM is parallel classifier, to complete a multi-class order, Pair-wise characterizations can be utilized computationally costly, accordingly runs moderate
Artificial Neural Network	High degree of non-linearity possible.	Hard to tune parameters. Takes time to build model.

Random Forest	It computes proximities between pairs for instances that might be utilized within grouping., (by scaling) give intriguing perspectives of the information The abilities of the above can be reached out to unlabeled information.	RF have been observed to over fit for some datasets with noisy classification/regression tasks.

V. CONCLUSION

By review different papers of ads image exploring main advantage of this method is, we can obtain higher recognition accuracy by using only depth information without using large dataset for training and machine learning method. The computational complexity can be reduced for recognizing depth image objects. In this paper we show different features and detection method, among them use with classifier we can get accurate result. But some methods are not relevant to some feature or we can say that not work with all object. Here the base paper show only content data but in future for proposed work we are going to use context data by using object detection method and also classifier. The main advantage of this method is, we can obtain higher recognition accuracy by using only depth information without using large dataset for training and machine learning method. The computational complexity can be reduced for recognizing depth image objects.

REFERENCES

[1] Michael Fire, Jonathan Schler. "Exploring Online Ad Images Using a Deep Convolutional Neural Network Approach" 2017.

[2] Jinsu Lee, Junseong Bang, and Seong Yang. "Object Detection With Sliding Window in Images Including Multiple Similar Objects".

[3] Meera M K, Shajee Mohan B S. "bject Recognition in Images" 2016.

[4] Jie Sheng Tham, Yoong Choon Chang and Mohammad Faizal Ahmad Fauzi "Object Recognition using Depth Information of a Consumer Depth Camera" IEEE 2015.

[5] Kyung Mo Koo, Eui Young Cha. "Image recognition performance enhancements using image normalization" 2017.

[6] Hideaki Yanagisawa, Takuro Yamashita, Hiroshi Watanabe." A Study on Object Detection Method from Manga Images using CNN" 2018.

[7] Csurka, G., C. R. Dance, L. Fan, J. Willamowski, and C. Bray. "Visual Categorization with Bags of Keypoints." Workshop on Statistical Learning in Computer Vision. ECCV 1 (1–22), 1–2.

[8] Jie Sheng Tham, Yong-Shen Chen, Mohammad Faizal Ahmad Fauzi, Yoong Choon Chang. "Depth Image Object Recognition using Moment Invariants"2016.

[9] Astha Gautam, Anjana Kumari and Pankaj Singh "The Concept of Object Recognition" IJARCSSE 2015.

[10] Dr. R.Muralidharan " Object Recognition Using K-Nearest Neighbor Supported By Eigen Value Generated From the Features of an Image" IJIRCCE 2014.

[11] Mingqiang Yang, Kidiyo Kpalma and Joseph Ronsin " A Survey of Shape Feature Extraction Techniques" IETR-INSA 2008

[12] Divya Srivastava, Rajesh Wadhvani and Manasi Gyanchandani "Review: Color Feature Extraction Methods for Content Based Retrieval Image"

[13] Link" https://in.mathworks.com/help/vision/ref/vision.cascadeobjectdetector-system-object.html".

Authors Profile

Mr. Krushil Makodbhai Bhadani pursed Bachelor from MGITER in Year 2016.currently pursuing Degree of Masters in Engineering from Sardar Vallabhbhai Patel Institute of Technology. In bachelors the intrested project was done ASP.NET with c# language and subject was web application. In master the research on image processing and machie learning.

Mrs B.J.Talati pursed Bachelor and Master of Computer Engineering from Dharamsinh Desai University in year 1997 and 2007. She is currently pursuing Ph.D at C.U.Shah Univeristy of Gujarat,India since 2015 and currently working as Assistant Professor in Department of Computer Engineering in S.V.I.T,Vasad. She is a member of IEEE & CSI, a life member of the ISTE since 2007. She has published more than 20 research papers in reputed international journals and conferences including IEEE and it's also available online. Her main research work focuses on Image Processing,Computer Algorithms, and Data Mining. She has 18 years of teaching experience and 4 years of Research Experience.

