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"Semantic Retrieval of Trademarks using Deep Learning for Conceptual Similarity on Text and Images"

Prof. Pramod Dhamdhere[1], Ashwini Nilakh[2], Sushmita Choudhari[3], Komal Jadhav[4],

Namrata Kate[5], Ankita Temgire[6]

[1]*Professor, Dept of information Technology, BSIOTR College, Wagholi, Pune, Maharashtra, India*
[2-6]*UG. Students, Dept of information Technology, BSIOTR College, Wagholi, Pune, Maharashtra, India*

Abstract - *The number of images related with weakly supervised user-provided tags has increased efficiently in recent years. User-provided tags are insufficient, subjective and noisy. In proposed system, focused on the problem of social image understanding, i.e., tag refinement, tag assignment, and image retrieval. Different from past work, system propose a novel weakly supervised deep matrix factorization algorithm, which expose the latent image illustration and tag representations fixed in the latent subspace by collaboratively searching the weakly supervised tagging data, the visual construction, and the semantic construction. The semantic and visual structures are jointly integrated to learn a semantic subspace without over-fitting the noisy, incomplete, or subjective tags. Besides, to remove the clamorous or redundant visual features, a sparse model is imposed on the transformation matrix of the first layer in the deep architecture. Huge experiments on real world social image databases are conducted on the tasks of image understanding: image tag refinement, assignment, and retrieval. promoting results are achieved, which exhibit the capability of the proposed method. Finally, a cooperative development problem with a right-defined objective task is developed to formulate the proposed problem and find solution by a up and down procedure with curvilinear searching. Huge experiments on actual world social image databases are conducted on the function of image understanding: image tag refinement, assignment, and retrieval. Promoting results are achieved with comparison with the state of-the-art algorithms, which prove the Capability of the proposed method. A trademark is a mark that you can use to recognize your business products or services from those of another dealer. It can be represented graphically in the form of any Symbol, logo, words etc. so, they need to be safety. The conceptual similarities among trademarks, which happens when more than two or more trademark similar*.

Keywords: User Provided Tags, Image Tag Refinement, Image Tag Assignment, Image Tag Retrieval, Social Image Understanding.

I) INTRODUCTION

In the social media networks human is considered as open and complicated framework. The demands of the user slightly changed likewise because the fulfilment requirements of single person may subspace by cooperatively investigating the weakly supervised tagging data, semantic structure and visual structure. Recent years have supported an increase in the number of community-contributed images related with rich contextual data such as user-provided tags. These users gave tags can portray the semantic substance of pictures to some degree, which is valuable to numerous functions, for example, picture tagging (which can be treated as an image to tag search), Content-Based Image Retrieval (CBIR) and Tag-Based Image Retrieval (TBIR). Subsequently, it is vital yet hard to collectively examine the rich data of network contributed pictures that is regularly normally accessible. By and by, connections are constantly required for numerous tasks, for example, picture tag relationship for cross modular search (i.e., picture tagging and TBIR), picture association for CBIR and tag link for tag extension in sure applications, and these connections must be exact. The amount of pictures associated with weakly supervised user-provided tags has expanded considerably as of late. User-provided tags are inadequate, abstract and boisterous. System centre on the issue of social picture understanding, for example tag assignment, image retrieval and tag refinement.

System propose a weakly supervised deep matrix factorization algorithm, in which reveals the inactive picture portrayals and tag portrayals inserted in the dormant environment in service is awareness about the circumstance. Then it can be easily adjusted to the dynamic service.

II) LITERATURE SURVEY

J. Tang et al. [5] present many image processing and pattern recognition problems; visual contents of images are currently de-scribed by high-dimensional features, which are often repetitive and loud. Creators proposed a novel unsupervised component choice plan, to be specific, non-negative phantom investigation with obliged excess, by together utilizing non-negative otherworldly clustering and redundancy analysis. The presented method can directly identify a discriminative subset of the most useful and redundancy-constrained features.

Z. Li et al. [6] present performance of TBIR is limited due to incorrect or noisy tag associated with the image uploaded on social websites. To overcome the performance issues some previous image retagging techniques are proposed to fine tune the tag information of social image in

transductive learning manner. However, most of the techniques are unable to handle the images which are not part of sampling data. In author proposed an approach of novel factorization called as Projective matrix factorization with unified embedding for tag learning and retagging. The learning phase previously tagging information of social images is applied to tag correlation matrix and find image. This can handle the large-scale social image retagging tasks.

Z. Lin et al. [7] present despite the fact that generally used for encouraging picture the executives, client gave picture labels are normally inadequate and deficient to portray entire semantic substance of relating pictures, bringing about execution debasement in label subordinate applications and in this way requiring powerful label consummation strategies. System proposed a novel plan indicated as LSR for programmed picture label finishing by means of picture explicit and tag-explicit Linear Sparse Reconstructions. Given an inadequate introductory labelling grid with each line speaking to a picture and every segment speaking to a tag, LSR ideally reproduces each picture (for example push) and each tag (for example section) with staying ones under imperatives of sparsity, considering picture likeness, picture label affiliation and tag-label simultaneousness.

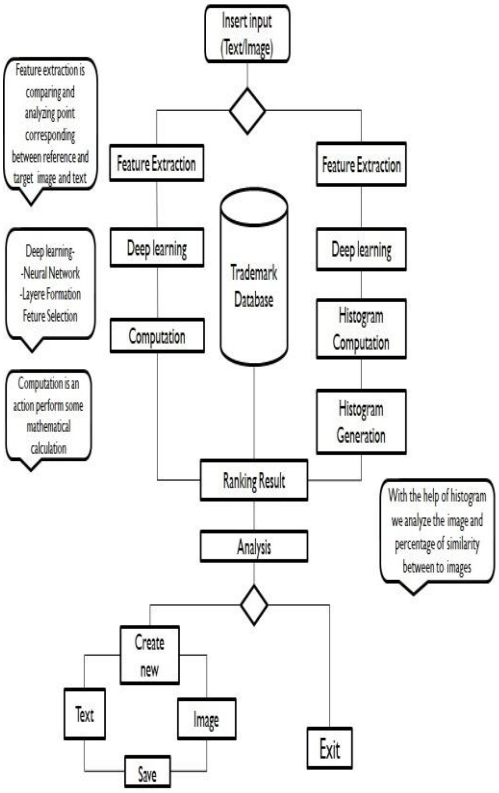
In this paper [8], the recent trademark reflow system of working with reformed reflow execution for the unification of global and local expositors. The global expositors are using the Zernike moment's coefficients and the local expositors are the edge-gradient co-occurrence matrix, defines as outline data that means it's mainly significance in human cognition of estimation equality. The defined reflow system is tested use the standard MPEG-7 shapes. The results reformation in the case of the MPEG-7 shape databases. The bonding during two proximate factors is hold on by usage the co-occurrence matrix on incline data. The research in the round of offered a novel system for trademark reflow that increase the execution.

Author proposed [9], A recent system for counting short-text and sentence semantic similarity. The method is depends on the concept that the sense of a statement is create of nope mere the sense of its particular words, but also the anatomical path the words are concatenated. Thus hold on and connects syntactic concatenated. Thus hold on and connects syntactic and semantic data to count the semantic similarity of two phrases. Semantic data is given from lexical resources. Syntactic data is get from a strong parsing procedure that searches the sentences in every phrase. A syntax-based providence to calculate the semantic similarity between phrases or short texts. The concept on which the system is based on the sense of phrases is creating of nope mere the senses of its particular words, but as well the different words are concatenated.

III) SYSTEM ARCHITECTURE

System proposed a novel Weakly-supervised Deep Matrix Factorization (WDMF) algorithm for social image tag refinement, assignment and retrieval, which uncovers the latent image representations and tag representations embedded in the latent subspace by collaboratively exploiting the weakly supervised tagging information, the visual structure and the semantic structure. The proposed approach can deal with the noisy, incomplete or subjective tags and the noisy or redundant visual features. The proposed approach is formulated as a joint optimization problem with a well-defined objective function, which is solved by a gradient descent procedure with curvilinear search. Extensive experiments on two real-world social image databases are conducted to demonstrate the effectiveness of the problem.

There are several potential research directions. First, system will explore the effective of the depth in the deep MF framework and how to adaptively identify better parameters for different vision tasks. Second, system will explore how to integrate the proposed deep MF model and CNN into a unified framework. Besides, system will extend the proposed deep MF framework to make it applicable and investigate its new applications such as image suggestion.



IV). ALGORITHM

Logo similarity algorithm

- **Input:** Query Image
- **Output:** Ranked Image
- **Rm-**Rotational invariant **Qm-** quantization matrix value of image
- Step 1: Extract the rotation invariant features

```
for (int x=0; x<image. width; x++)
{
for (int y=0; y<image. height; y++)
{
Rm(x,y,I)=Qm(x,y,I)Qm(x,y,I)*
 }
}
```

- Step 2: Store all features as multidimensional vector.

```
Vector multi=new Vector ( );
multi. Add (Rm);
```

- Step 3: Histogram is computed and normalized for each trademark image.
- Step 4: Extract query image features with histogram computation.
- Step 5: Calculate the similarity of query image and i-th image of dataset.
- Step 6: Display ranked targeted images according to the output of step 5.

VI) MATHEMATICAL MODEL

Let S be the whole System,

Set S = {I, P, R, O} Where,

{I} = set of all inputs given to system.

{P} = set of all processes in system.

{R} = set of rules that drives your input set.

{O} = set of output expected from system.

Input (I) represented as: I = {I1, I2}

I1 : User Registration details.

I2 : Query Trademark.

Process : P= { P1, P2, P3, P4, P5 }

P1 : Login by user side.

P2 : Approval of login.

P3 : Feature extraction.

P4 : Hash map indexing.

P5 : Distance computation.

Rule : R = {R1}

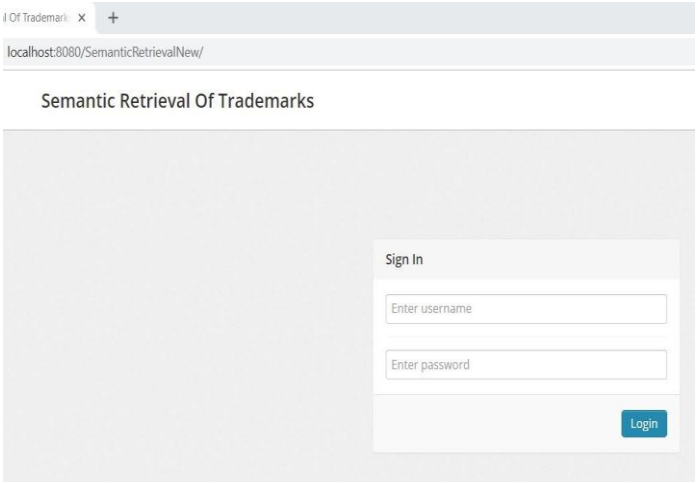
R1 = System should identify similarities between query trademark and database trademark semantically.

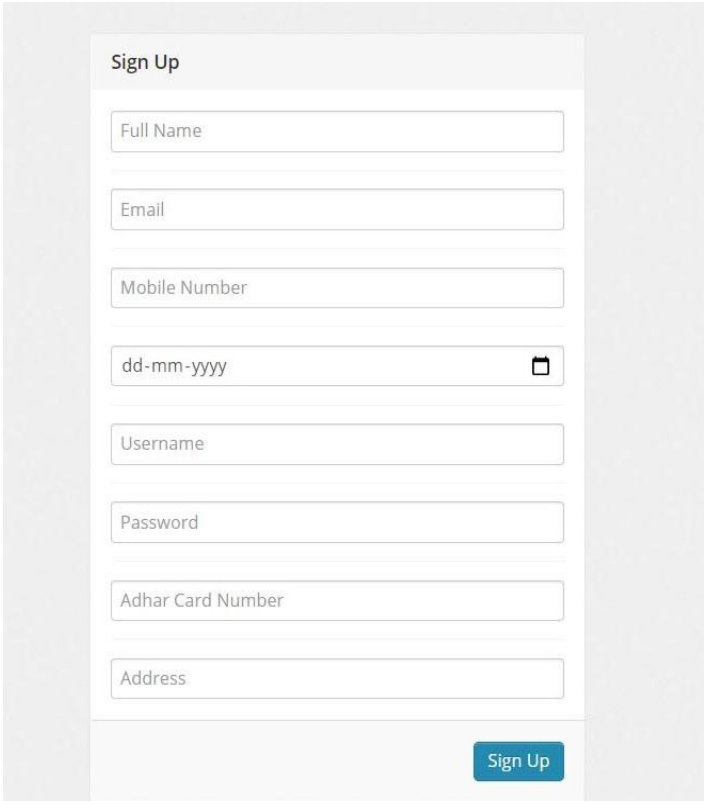
Output : O = { O1, O2 }

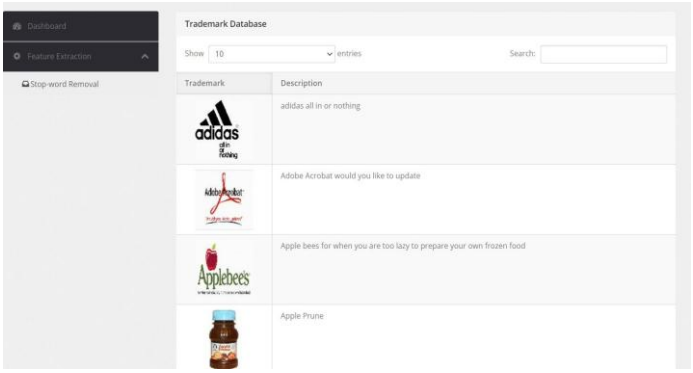
O1 = Message display

O2 = show suggestion

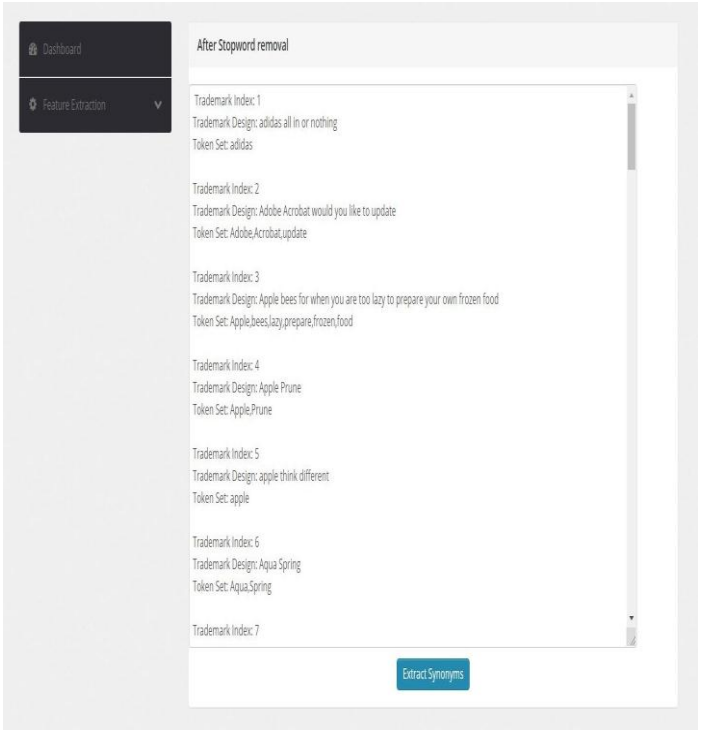
VII) RESULTS

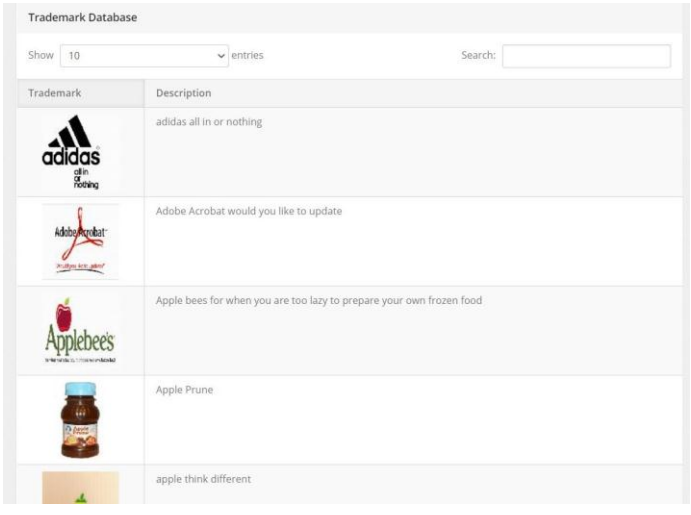


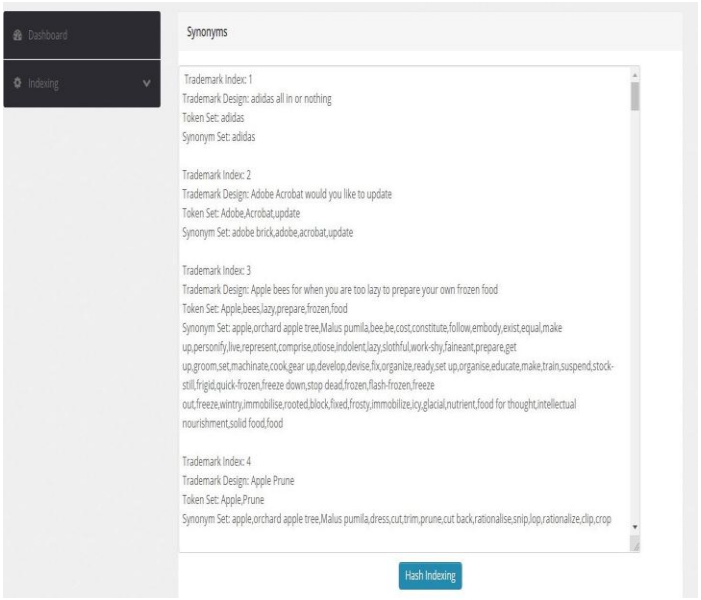

Sign Up
Full Name
Email
Mobile Number
dd-mm-yyyy
Username
Password
Adhar Card Number
Address
Sign Up

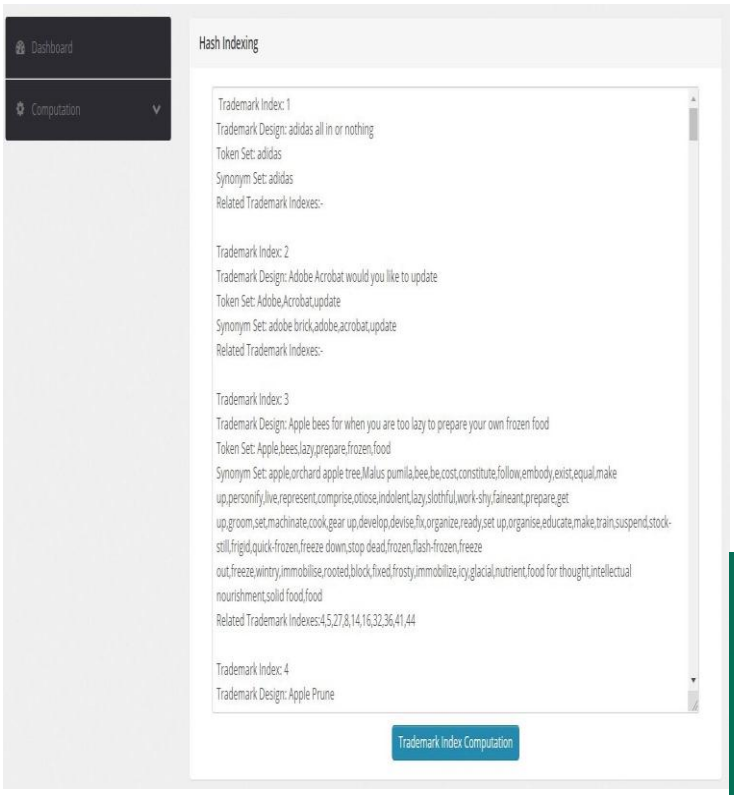

Dashboard
Feature Extraction
Stop-word Removal
Trademark Database
Show 10 entries
Search:
Trademark
Description
adidas all in or nothing
Adobe Acrobat would you like to update
Apple bees for when you are too lazy to prepare your own frozen food
Apple Prune


localhost:8080 says
User registration successfully
OK


Dashboard
Feature Extraction
After Stopword removal
Trademark Index: 1
Trademark Design: adidas all in or nothing
Token Set: adidas
Trademark Index: 2
Trademark Design: Adobe Acrobat would you like to update
Token Set: Adobe,Acrobat,update
Trademark Index: 3
Trademark Design: Apple bees for when you are too lazy to prepare your own frozen food
Token Set: Apple,bees,lazy,prepare,frozen,food
Trademark Index: 4
Trademark Design: Apple Prune
Token Set: Apple,Prune
Trademark Index: 5
Trademark Design: apple think different
Token Set: apple
Trademark Index: 6
Trademark Design: Aqua Spring
Token Set: Aqua,Spring
Trademark Index: 7
Extract Synonyms

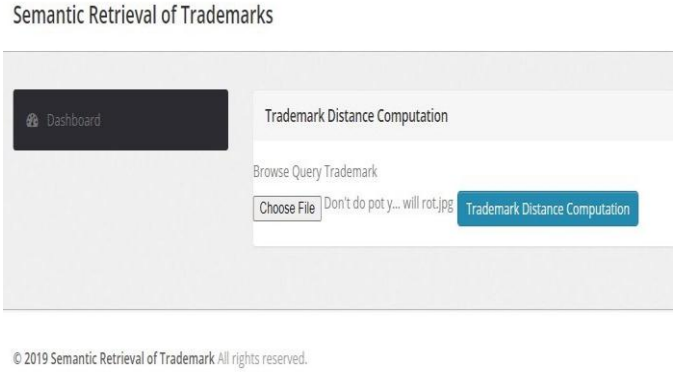

Trademark Database
Show 10 entries
Search:
Trademark
Description
adidas all in or nothing
Adobe Acrobat would you like to update
Apple bees for when you are too lazy to prepare your own frozen food
Apple Prune
apple think different


Dashboard
Indexing
Synonyms
Trademark Index: 1
Trademark Design: adidas all in or nothing
Token Set: adidas
Synonym Set: adidas
Trademark Index: 2
Trademark Design: Adobe Acrobat would you like to update
Token Set: Adobe,Acrobat,update
Synonym Set: adobe brick,adobe,acrobat,update
Trademark Index: 3
Trademark Design: Apple bees for when you are too lazy to prepare your own frozen food
Token Set: Apple,bees,lazy,prepare,frozen,food
Synonym Set: apple,orchard apple tree,Malus pumila,bee,be,cost,constitute,follow,embody,exist,equal,make up,personify,live,represent,comprise,otiose,indolent,lazy,slothful,work-shy,faineant,prepare,get up,groom,set,machinate,cook,gear up,develop,devise,fix,organize,ready,set up,organise,educate,make,train,suspend,stock-still,frigid,quick-frozen,freeze down,stop dead,frozen,flash-frozen,freeze out,freeze,wintry,immobilise,rooted,block,fixed,frosty,immobilize,icy,glacial,nutrient,food for thought,intellectual nourishment,solid food,food
Trademark Index: 4
Trademark Design: Apple Prune
Token Set: Apple,Prune
Synonym Set: apple,orchard apple tree,Malus pumila,dress,cut,trim,prune,cut back,rationalise,snip,lop,rationalize,clip,crop
Hash Indexing


Dashboard
Computation
Hash Indexing
Trademark Index: 1
Trademark Design: adidas all in or nothing
Token Set: adidas
Synonym Set: adidas
Related Trademark Indexes:-
Trademark Index: 2
Trademark Design: Adobe Acrobat would you like to update
Token Set: Adobe,Acrobat,update
Synonym Set: adobe brick,adobe,acrobat,update
Related Trademark Indexes:-
Trademark Index: 3
Trademark Design: Apple bees for when you are too lazy to prepare your own frozen food
Token Set: Apple,bees,lazy,prepare,frozen,food
Synonym Set: apple,orchard apple tree,Malus pumila,bee,be,cost,constitute,follow,embody,exist,equal,make up,personify,live,represent,comprise,otiose,indolent,lazy,slothful,work-shy,faineant,prepare,get up,groom,set,machinate,cook,gear up,develop,devise,fix,organize,ready,set up,organise,educate,make,train,suspend,stock-still,frigid,quick-frozen,freeze down,stop dead,frozen,flash-frozen,freeze out,freeze,wintry,immobilise,rooted,block,fixed,frosty,immobilize,icy,glacial,nutrient,food for thought,intellectual nourishment,solid food,food
Related Trademark Indexes:4,5,27,8,14,16,32,36,41,44
Trademark Index: 4
Trademark Design: Apple Prune
Trademark Index Computation


Similarity Based Image Extraction
Upload Images:
Choose Files No file chosen
Upload


Similarity Based Image Extraction
Upload Images:
Choose Files Walmart Save... better.jpg
Upload


Semantic Retrieval of Trademarks
Dashboard
Trademark Distance Computation
Browse Query Trademark
Choose File Don't do pot y... will rot.jpg
Trademark Distance Computation
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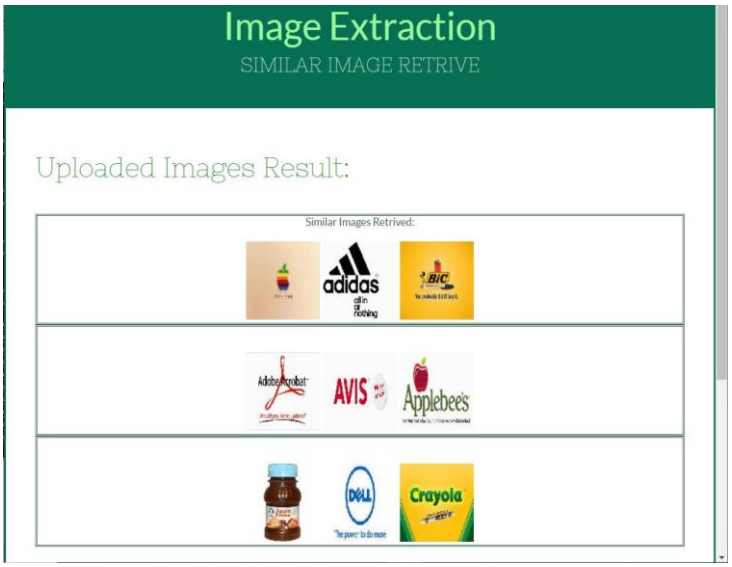
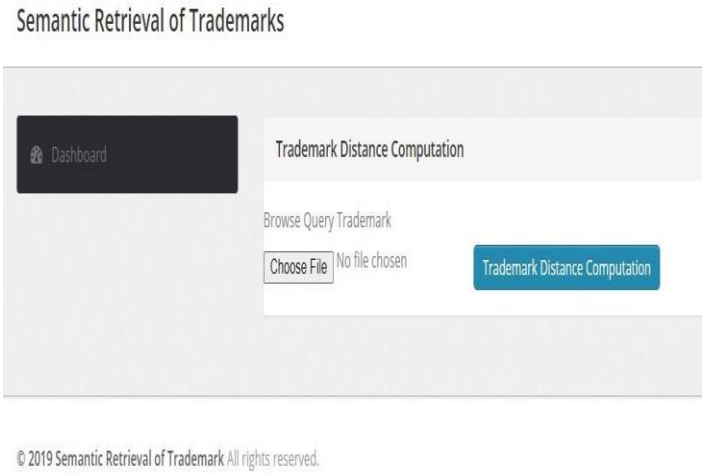


Image Extraction
SIMILAR IMAGE RETRIVE
Uploaded Images Result:
Similar Images Retrived:
adidas
AVIS
Applebee's
DELL
Crayola


Semantic Retrieval of Trademarks
Dashboard
Trademark Distance Computation
Browse Query Trademark
Choose File No file chosen
Trademark Distance Computation
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VIII) CONCLUSIONS

Proposed novel Deep Collaborative Embedding (DCE) model for social image understanding. It integrate the end-to-end learning and coordinated calculate investigation one brought together structure for the ideal comparison of representation learning and dormant space revelation. To cooperatively examine the rich logical data of social images, it factorizes various correlation matrices at the same time and correctly. A refined tagging matrix with non-negative and discrete properties is perticularly figured out how to deal with the noisy tags. The proposed strategy is linked to social image tag refinement and assignment, content-based image recovery, tag-based image recovery and tag growth. Weakly-supervised Deep Matrix Factorization (WDMF) algorithm for social image tag refinement, assignment and retrieval, which detect the latent image description and tag description embedded in the latent subspace by collaboratively exploiting the weakly supervised tagging information, the visual structure and the semantic structure. To well handle the out-of-sample problem, the underlying image description are assumed to be progressively transformed from the visual feature space. Besides, the proposed approach can deal with the noisy, insufficient or subjective tags and the noisy or redundant visual features. The proposed problem is formulated as a joint optimization problem with a well-defined objective function, which is solved by a gradient descent procedure with curvilinear search.

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