

FORM 1 THE PATENTS ACT, 1970 (39 of 1970) & THE PATENTS RULES, 2003 APPLICATION FOR GRANT OF PATENT [See sections 7, 54 & 135 and rule 20(1)]	(FOR OFFICE USE ONLY) Application No.: Filing Date: Amount of Fee Paid: CBR No.: Signature:
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1. APPLICANT(S):

Sr.No	Name	Nationality	Address	Country	State
1	Prof.M.James Stephen	India	Professor, Department of CSE, Welfare Institute of Science Technology and Management (WISTM), Visakhapatnam, Andhra Pradesh, India. Pin Code:530007	India	Andhra Pradesh
2	Mr.Sreekanth Puli	India	Research Scholar, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh
3	Mr.Padala Pushkal	India	Department of CSE, The National Institute of Engineering, Mysore, Karnataka, India. Pin Code: 570008	India	Karnataka
4	Prof. P.V.G.D. Prasad Reddy	India	Senior Professor, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh

2. INVENTOR(S):

Sr.No	Name	Nationality	Address	Country	State
1	Prof.M.James Stephen	India	Professor, Department of CSE, Wellfare Institute of Science Technology and Management (WISTM), Visakhapatnam, Andhra Pradesh, India. Pin Code:530007	India	Andhra Pradesh
2	Mr.Sreekanth Puli	India	Research Scholar, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh
3	Mr.Padala Pushkal	India	Department of CSE, The National Institute of Engineering, Mysore, Karnataka, India. Pin Code: 570008	India	Karnataka
4	Prof. P.V.G.D. Prasad Reddy	India	Senior Professor, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh

3. TITLE OF THE INVENTION: Content based Image Retrieval System with Edge based structural Feature Extraction**4. ADDRESS FOR CORRESPONDENCE OF APPLICANT/ AUTHORISED PATENT AGENT IN INDIA:**

Prof.M.James Stephen, Professor, Department of CSE, Wellfare Institute of Science Technology and Management (WISTM), Visakhapatnam, Andhra Pradesh, India. Pin Code:530007

Telephone No.:
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5. PRIORITY PARTICULARS OF THE APPLICATION(S) FILED IN CONVENTION COUNTRY:

Sr.No	Country	Application Number	Filing Date	Name of the Applicant	Title of the Invention
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6. PARTICULARS FOR FILING PATENT COOPERATION TREATY (PCT) NATIONAL PHASE APPLICATION:

International Application Number	International Filing Date as Allotted by the Receiving Office
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PCT//	
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7. PARTICULARS FOR FILING DIVISIONAL APPLICATION

Original (first) Application Number	Date of Filing of Original (first) Application
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8. PARTICULARS FOR FILING PATENT OF ADDITION:

Main Application / Patent Number:	Date of Filing of Main Application
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9. DECLARATIONS:

(i) Declaration by the inventor(s):

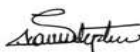
I/We, Prof.M.James Stephen, Mr.Sreekanth Puli, Mr.Padala Pushkal, Prof. P.V.G.D. Prasad Reddy, is/are the true & first inventor(s) for this invention and declare that the applicant(s) herein is/are my/our assignee or legal representative.

(a)Date: ----- Dated this 12th day of November, 2020

(b)Signature(s) of the inventor(s):

(c)Name(s):

Prof.M.James Stephen



Mr.Sreekanth Puli



Mr.Padala Pushkal



Prof. P.V.G.D. Prasad Reddy



(ii) Declaration by the applicant(s) in the convention country:

I/We, the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative.

(a)Date: ----- Dated this 12th day of November, 2020

(b)Signature(s) of the inventor(s):

(c)Name(s):

Prof.M.James Stephen




Mr.Sreekanth Puli



Mr.Padala Pushkal



Prof. P.V.G.D. Prasad Reddy



(iii) Declaration by the Applicant(s):

- The Complete specification relating to the invention is filed with this application.
- I am/ We are, in the possession of the above mentioned invention.
- There is no lawful ground of objection to the grant of the Patent to me/us.

10. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION:

Sr.No	Document Description	File Name
1	Complete Specifications(Form-2)	CompletespecificationsForm2.pdf
2	Drawings	Drawings.pdf
3	Request For Early Publication(Form-9)	Form9.pdf
4	Statement of Undertaking (Form 3)	Form3.pdf
5	Declaration of Inventorship (Form 5)	Form5.pdf

I/We hereby declare that to the best of my/our knowledge, information and belief the fact and matters stated herein are correct and I/We request that a patent may be granted to me/us for the said invention.

Dated this (Final Payment Date): -----

Signature:

Name(s):

Prof.M.James Stephen



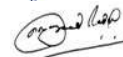
Mr.Sreekanth Puli



Mr.Padala Pushkal



Prof. P.V.G.D. Prasad Reddy



To

The Controller of Patents

The Patent office at CHENNAI

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202041049592 A

(19) INDIA

(22) Date of filing of Application :13/11/2020

(43) Publication Date : 27/11/2020

(54) Title of the invention : CONTENT BASED IMAGE RETRIEVAL SYSTEM WITH EDGE BASED STRUCTURAL FEATURE EXTRACTION

(51) International classification	:G06F 16/583	(71)Name of Applicant : 1)Prof.M.James Stephen Address of Applicant :Professor, Department of CSE, Welfare Institute of Science Technology and Management (WISTM),Visakhapatnam, Andhra Pradesh, India. Pin Code:530007 Andhra Pradesh India
(31) Priority Document No	:NA	2)Mr.Srekanth Puli
(32) Priority Date	:NA	3)Mr.Padala Pushkal
(33) Name of priority country	:NA	4)Prof. P.V.G.D. Prasad Reddy
(86) International Application No	:NA	(72)Name of Inventor :
Filing Date	:NA	1)Prof.M.James Stephen
(87) International Publication No	: NA	2)Mr.Srekanth Puli
(61) Patent of Addition to Application Number	:NA	3)Mr.Padala Pushkal
Filing Date	:NA	4)Prof. P.V.G.D. Prasad Reddy
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

The Majority of the Multimedia Data is due to the Digital Images. The Complexity in the multimedia data is increasing day by day as the more number of Digital Images are being uploaded every minute. The traditional text based search can be used to retrieve the Digital Images from the several repositories. The retrieval of the correct Image is difficult with the traditional text based search to identify the Image Index as there is large database for the multimedia data. The strongest feature of an Image is Edge for its characterization, Edge regions can be detected by the Edge detection. The Present Invention disclosed here in is Content based Image Retrieval System with Edge based structural Feature Extraction comprising of: Dataset (201); Image Query (202); Edge Detection Operator (203); Feature Extraction (204); Classification (205); Image Retrieval (206); can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction. The present invention uses Image based search to retrieval of similar Contents of an Image.

No. of Pages : 13 No. of Claims : 6

FORM 2

THE PATENTS ACT, 1970
(39 of 1970) &
THE PATENTS RULES, 2003
COMPLETE SPECIFICATION
(See section 10, rule 13)

1. TITLE OF THE INVENTION:

**CONTENT BASED IMAGE RETRIEVAL SYSTEM WITH
EDGE BASED STRUCTURAL FEATURE EXTRACTION**

2. APPLICANT(S)

Sr.No	Name	Nationality	Address	Country	State
1	Prof.M.James Stephen	India	Professor, Department of CSE, Welfare Institute of Science Technology and Management (WISTM), Visakhapatnam, Andhra Pradesh, India. Pin Code:530007	India	Andhra Pradesh
2	Mr.Sreekanth Puli	India	Research Scholar, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh
3	Mr.Padala Pushkal	India	Department of CSE, The National Institute of Engineering, Mysore, Karnataka, India. Pin Code: 570008	India	Karnataka
4	Prof. P.V.G.D. Prasad Reddy	India	Senior Professor, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh

3. PREAMBLE TO THE DESCRIPTION:

COMPLETE SPECIFICATION

The following specification particularly describes the invention and the manner in which it is to be performed.

CONTENT BASED IMAGE RETRIEVAL SYSTEM WITH EDGE BASED STRUCTURAL FEATURE EXTRACTION

FIELD OF INVENTION

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The present invention relates to the technical field of Digital Image Processing.

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Particularly, the present invention is related Content based Image Retrieval System with Edge based structural Feature Extraction of the broader field of Computer Vision in the Digital Image Processing.

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More particularly, the present invention is related to Content based Image Retrieval System with Edge based structural Feature Extraction can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction.

BACKGROUND & PRIOR ART

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The majority of the multimedia data is Digital Images such as Gray Scale or Colour Images. Due to the increasing use of internet facility, majority of the users uploading many images into the database. To search the images which are present in the database, a traditional method of Text search is using but due to text type search correct image may not be retrieved by the user and searching takes more and more time consuming factors. The automatic extraction of the image from the database is required to overcome the problem of time consumption. Now computer vision is developed and facilitates the Content based Retrieval system to retrieve the Image contents by query image without text search. The edge of an image is the powerful feature of the Image to extract and number of operators available to obtain the edge of an image. The present invention can be used in the medicine, fingerprint identification, biodiversity information systems, digital libraries, crime prevention.

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The present invention, Referring to Figure 2, illustrates Content based Image Retrieval System with Edge based structural Feature Extraction comprising of: Dataset (201); Image Query (202); Edge Detection Operator (203); Feature Extraction (204); Classification (205); Image Retrieval (206); can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction. The present invention uses Image based search to retrieval of similar Contents of an Image.

There are some technologies developed for Image Retrieval. But the way of Image Retrieval is different than the invention disclosed here in. Some of the work listed in the prior art is as follows:

US6751343 - *Method for indexing and retrieving manufacturing-specific digital imagery based on image content*, presents “A method for indexing and retrieving manufacturing-specific digital images based on image content comprises three steps. First, at least one feature vector can be extracted from a manufacturing-specific digital image stored in an image database. In particular, each extracted feature vector corresponds to a particular characteristic of the manufacturing-specific digital image, for instance, a digital image modality and overall characteristic, a substrate/background characteristic, and an anomaly/defect characteristic. Notably, the extracting step includes generating a defect mask using a detection process. Second, using an unsupervised clustering method, each extracted feature vector can be indexed in a hierarchical search tree. Third, a manufacturing-specific digital image associated with a feature vector stored in the hierarchial search tree can be retrieved, wherein the manufacturing-specific digital image has image content comparably related to the image content of the query image. More particularly, can include two data reductions, the first performed based upon a query vector extracted from a query image. Subsequently, a user can select relevant images resulting from the first data reduction. From the selection, a prototype vector can be calculated, from which a second-level data reduction can be performed. The second-level data reduction can result in a subset of feature

vectors comparable to the prototype vector, and further comparable to the query vector. An additional fourth step can include managing the hierarchical search tree by substituting a vector average for several redundant feature vectors encapsulated by nodes in the hierarchical search tree.”

US6803919 - *Extracting texture feature values of an image as texture descriptor in a texture description method and a texture-based retrieval method in frequency domain*, states “A texture description method in frequency domains and a texture-based retrieval method using the same, in which image signals are converted into those in a frequency domain of a Polar coordinate system. The texture description method in the frequency domain includes a first step of generating a frequency layout by partitioning the frequency domain into a set of feature channels; a second step of extracting the texture feature values of the image from the respective feature channels; and a third step of constituting a texture descriptor of the image in a vector form using the texture feature values extracted from the respective feature channels of the frequency layout. In a texture-based retrieval described in the frequency domain, a retrieval method capable of satisfying respective or all the retrieval conditions such as scale-, rotation- and intensity-invariant retrieval of relevant texture images is provided. Also, a retrieval method of computing the rough scheme of texture to provide a browsing functionality in retrieving is provided.”

US8457446 - *Image retrieval apparatus, image retrieval method, and storage medium*, states “An image retrieval apparatus includes a designation unit configured to designate a query area of an image based on a user's designation operation, a display unit configured to display an area where a local feature amount is difficult to be extracted in the query area designated by the designation unit as a feature non-extractable area, and a retrieval unit configured to retrieve, based on a local feature amount extracted from an area which is not displayed as the feature non-extractable area in the query area by the display unit, image feature data with which a local feature amount and the image are associated and which is stored in a storage device.”

JP2001195565 - *Method and Device for Retrieving Moving Object Image*, states “This device is composed of a means for registering the aerial image, obtained by photographing the moving object, the photographing time of this aerial image and photographing position information in the image data base, an object image segmenting means for segmenting the object from these aerial images and preparing the object image, an object image feature amount extracting means for extracting a feature amount from the object image, a means for registering the object image and its feature amount in the image data base, a means for extracting an object image feature amount from the object image to be the retrieval key, means for retrieving the object image, obtained by photographing the same object as the object image to be the retrieval key, by collating the object image feature amount registered in the image data base with the feature amount of the object image to become the retrieval key, and means for changing and displaying the area of the aerial image so as to include ground and an object to be the reference of the position of the object in the aerial image of the segmentation source of the retrieved object image.”

WO/2015/153480- *Image-Based Retrieval and Searching*, states “In various example embodiments, a system and method for image query are presented. A feature detector generates first feature description data of a first type. An image processor accesses feature codes and angle bins. The image processor generates second feature description data of a second type by comparing a plurality of groups with respective codes of the feature codes. Each of the plurality of groups comprises at least of portion of the first feature description data determined based at least on the feature codes and the angle bins. A search engine selects a first one of a plurality of stored feature description data linked to respective stored images. An interface provides an indication of the stored image linked to the first stored feature description data for display of the stored image linked to the first stored feature description data on a remote device.”

Groupings of alternative elements or embodiments of the invention disclosed herein are not to be construed as limitations. Each group member

can be referred to and claimed individually or in any combination with other members of the group or other elements found herein. One or more members of a group can be included in, or deleted from, a group for reasons of convenience and/or patentability. When any such inclusion or deletion occurs, the specification is herein deemed to contain the group as modified thus fulfilling the written description of all related groups used in the appended claims.

The above information disclosed in this Background section is only for enhancement of understanding of the background of the invention and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

SUMMARY OF INVENTION

The present invention, Refereeing to Figure 1, Traditional Content Retrieval System based on Text comprising of Text Search: Parrots (101); Text Based Image Retrieval (102); Database (103); Results (104); provides the traditional content retrieval based on the text search.

Refereeing to Figure 2, Content based Image Retrieval System with Edge based structural Feature Extraction comprising of: Dataset (201); Image Query (202); Edge Detection Operator (203); Feature Extraction (204); Classification (205); Image Retrieval (206); can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction.

The present invention disclosed here is Content based Image Retrieval System with Edge based structural Feature Extraction can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction. The dataset contains the large number of images of multimedia data. Image Query is performed by the content based image retrieval system than can perform the edge detection or produces an edge of an image by the edge detection operators. In the disclosure Sobel, Canny, Roberts, Prewitt and Log operator are used to obtain the edge of an image. For the edge region,

feature extraction is performed by edge pixel matrix of an edge region of the image, with one's matrix and feature vector generation to obtain best features from the edge region of an image. Best features are selected by the distance based classification to retrieve the image.

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BRIEF DESCRIPTION OF SYSTEM

The Accompanying Drawings are included to provide further understanding of the invention disclosed here, and are incorporated in and constitute a part
10 this specification. The drawing illustrates exemplary embodiments of the present disclosure and, together with the description, serves to explain the principles of the present disclosure. The Drawings are for illustration only, which thus not a limitation of the present disclosure.

The present invention, Referring to Figure 1, Traditional Content Retrieval
15 System based on Text comprising of Text Search: Parrots (101); Text Based Image Retrieval (102); Database (103); Results (104); provides the traditional content retrieval based on the text search.

Referring to Figure 2, illustrates Content based Image Retrieval System
20 with Edge based structural Feature Extraction comprising of: Dataset (201); Image Query (202); Edge Detection Operator (203); Feature Extraction (204); Classification (205); Image Retrieval (206); can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction.

Referring to Figure 1, illustrates Traditional Content Retrieval System
25 based on Text, in accordance with an exemplary embodiment of the present disclosure.

Referring to Figure 2, illustrates Content based Image Retrieval System
with Edge based structural Feature Extraction, in accordance with another
exemplary embodiment of the present disclosure.

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DETAIL DESCRIPTION OF THE SYSTEM

The entire illustrates Content based Image Retrieval System with Edge based structural Feature Extraction is explored and Content based Image Retrieval System with Edge based structural Feature Extraction is provided in the following layout that explains the entire view of the implementation of the invention that can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction.

Refereeing to Figure 1, Traditional Content Retrieval System based on Text comprising of Text Search: Parrots (101); Text Based Image Retrieval (102); Database (103); Results (104); provides the traditional content retrieval based on the text search. The Text search (101) is for searching the content which is present in the Database (103) by the Image Retrieval System (102). Particularly in this embodiment, the text search (101) is parrot; Image retrieval system produces the retrieval images as parrots (105) from the Database (103). This Method is a traditional method produces multiple images in the search results causes difficulty in selecting the correct image. To overcome the difficulty, Image base search is carried out in the present invention disclosed.

Refereeing to Figure 2, Content based Image Retrieval System with Edge based structural Feature Extraction comprising of: Dataset (201); Image Query (202); Edge Detection Operator (203); Feature Extraction (204); Classification (205); Image Retrieval (206); can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction. The Dataset (201) contains multimedia data that is several digital Images on which search is performed. The Image Query (202) is to search an image present in the Dataset to facilitate the Image based content retrieval. The Edge Detection Operator (203) creates an edge of Image Query (202), Edge is the powerful feature of an image to be extracted by the retrieval system. The Edge operator (203) may be Sobel, Canny, Roberts, Prewitt and Log operator. Using these operators edge of an image is computed for better selection of

the feature of an Image Query (202). The Feature Extraction (204) in the invention disclosed here is used to extract the best features by performing edge pixel matrix of an edge region of the image, performs the one's matrix identification to separate background of an edge Image, and performs Index feature vector to provide best feature of an edge image. The Classification (205) is the distance based classification can selects the best features from the feature extraction and compare the features with the query image features thereby produces the suitable Images for Image Retrieval (206) process. The present invention disclosed here does not required pre-segmentation before feature selection and also provides the accuracy of 99.5%, Specificity of 100% and Sensitivity of 96.4%. The limited numbers of edge pixels are considered for better selection of the features in the invention disclosed.

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Stephen

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CLAIMS

We claim:

1. A Content based Image Retrieval System with Edge based structural Feature Extraction comprising of: Dataset (201); Image Query (202); Edge Detection Operator (203); Feature Extraction (204); Classification (205); Image Retrieval (206); can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction.
2. Content based Image Retrieval System with Edge based structural Feature Extraction as claimed in claim 1, wherein it uses Sobel, Canny, Roberts, Prewitt and Log operator to compute an edge region of query image.
3. Content based Image Retrieval System with Edge based structural Feature Extraction as claimed in claim 1, wherein it uses Feature Extraction by the edge pixel matrix of an edge region of the image, one's matrix identification to separate background of an edge Image, and performs Index feature vector to provide best feature of an edge image.
4. Content based Image Retrieval System with Edge based structural Feature Extraction as claimed in claim 1, wherein it Distance Based Feature classification to retrieve the Images.
5. Content based Image Retrieval System with Edge based structural Feature Extraction as claimed in claim 1, wherein it does not uses pre-segmentation before feature selection.
6. Content based Image Retrieval System with Edge based structural Feature Extraction as claimed in claim 1, wherein it provides the accuracy of 99.5%, Specificity of 100% and Sensitivity of 96.4%, limited numbers of edge pixels are considered for better selection of the features.

Dated this 12th day of November, 2020

11 Meka James
Stephen

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James Stephen
Date: 2020.11.13 00:00:35
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CONTENT BASED IMAGE RETRIEVAL SYSTEM WITH EDGE BASED STRUCTURAL FEATURE EXTRACTION

ABSTRACT

The Majority of the Multimedia Data is due to the Digital Images. The Complexity in the multimedia data is increasing day by day as the more number of Digital Images are being uploaded every minute. The traditional text based search can be used to retrieve the Digital Images from the several repositories. The retrieval of the correct Image is difficult with the traditional text based search to identify the Image Index as there is large database for the multimedia data. The strongest feature of an Image is Edge for its characterization, Edge regions can be detected by the Edge detection. The Present Invention disclosed here in is Content based Image Retrieval System with Edge based structural Feature Extraction comprising of: Dataset (201); Image Query (202); Edge Detection Operator (203); Feature Extraction (204); Classification (205); Image Retrieval (206); can automatically retrieve the query image from the large multimedia database by identifying image indexing, with Edge based structural Feature Extraction. The present invention uses Image based search to retrieval of similar Contents of an Image.

Dated this 12th day of November, 2020

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DRAWINGS

Total No of Sheets: 1

Sheet No.1

Applicants: Prof.M.James Stephen, Mr.Sreekanth Puli, Mr.Padala Pushkal,
Prof. P.V.G.D. Prasad Reddy.

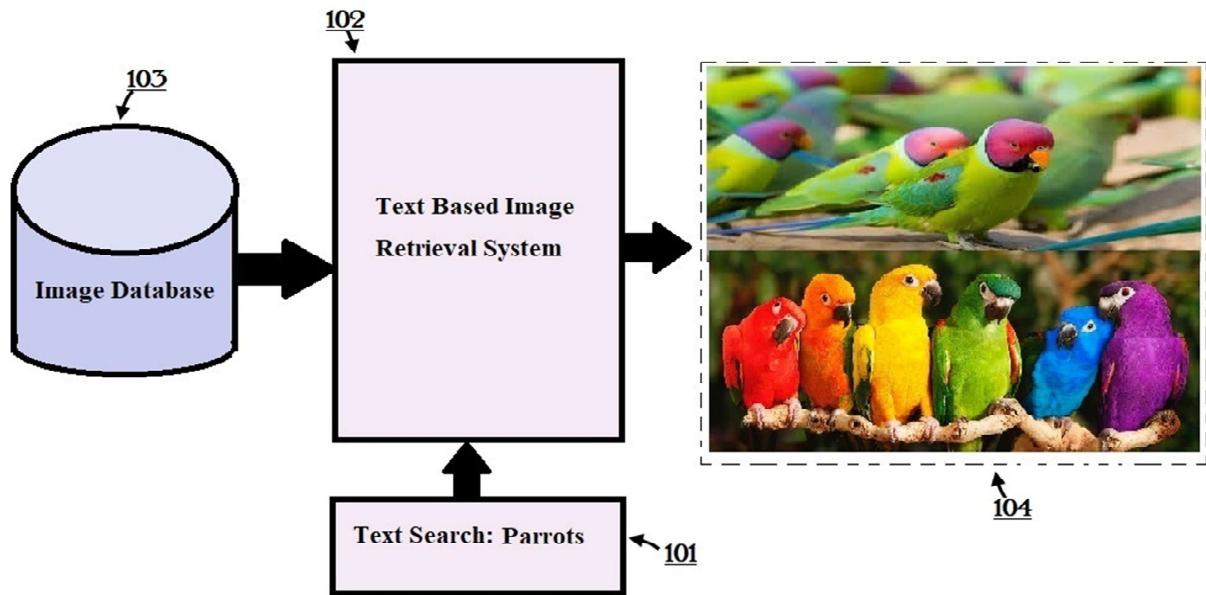


FIGURE 1: Traditional Content Retrieval System based on Text

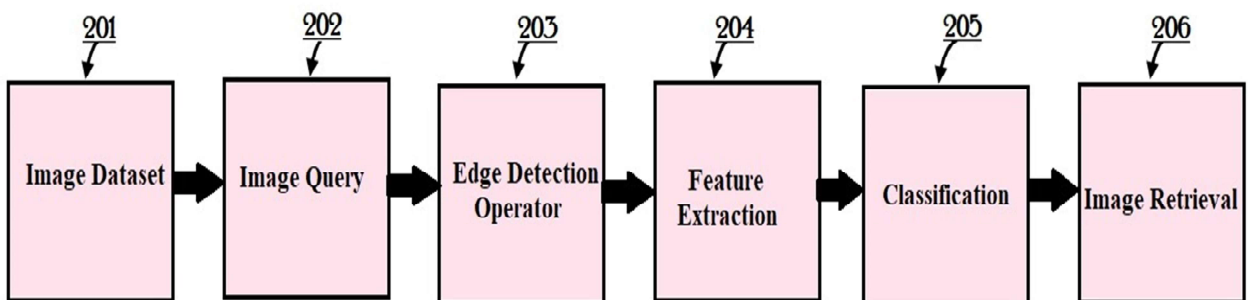


FIGURE 2: Content based Image Retrieval System with Edge based structural Feature Extraction

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Stephen
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FORM 9

THE PATENT ACT, 1970

(39 of 1970)

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THE PATENTS RULES, 2003

REQUEST FOR PUBLICATION

[See section 11A (2); rule 24A]

I/We **Prof.M.James Stephen, Mr.Sreekanth Puli, Mr.Padala Pushkal, Prof. P.V.G.D. Prasad Reddy** hereby request for early publication of my/our application for patent, titled “**Content based Image Retrieval System with Edge based structural Feature Extraction**” dated 12-11-2020, under section 11A(2) of the act.

Dated this 12th day of November 2020 **00:00:00** under section 11A (2) of the Act.

1. Name, Nationality and address of Applicants:

Sr.No	Name	Nationality	Address	Country	State
1	Prof.M.James Stephen	India	Professor, Department of CSE, Wellfare Institute of Science Technology and Management (WISTM), Visakhapatnam, Andhra Pradesh, India. Pin Code:530007	India	Andhra Pradesh
2	Mr.Sreekanth Puli	India	Research Scholar, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh
3	Mr.Padala Pushkal	India	Department of CSE, The National Institute of Engineering, Mysore, Karnataka, India. Pin Code: 570008	India	Karnataka
4	Prof. P.V.G.D. Prasad Reddy	India	Senior Professor, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh

2. To be signed by the applicant or authorized registered patent

Dated this...12th day of November 2020

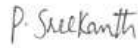
3. Name of Applicant(s)/ Inventor(s) Signature(s):

Name of the natural person who has signed. Signature:-

Prof.M.James Stephen



Mr.Sreekanth Puli



Mr.Padala Pushkal



Prof. P.V.G.D. Prasad Reddy



To

The Controller of Patents

The Patent office at CHENNAI

FORM 3

THE PATENTS ACT, 1970
(39 of 1970)
and
THE PATENTS RULES, 2003

STATEMENT AND UNDERTAKING UNDER SECTION 8

(See section 8; Rule 12)

1. Name of Applicant(s):

Prof.M.James Stephen, Mr.Sreekanth Puli, Mr.Padala Pushkal, Prof. P.V.G.D. Prasad Reddy.

2. Name, Address and Nationality of the Applicant(s):

Sr.No	Name	Nationality	Address	Country	State
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3	Mr.Padala Pushkal	India	Department of CSE, The National Institute of Engineering, Mysore, Karnataka, India. Pin Code: 570008	India	Karnataka
4	Prof. P.V.G.D. Prasad Reddy	India	Senior Professor, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh




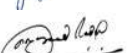
I/We, Prof.M.James Stephen, Mr.Sreekanth Puli, Mr.Padala Pushkal, Prof. P.V.G.D. Prasad Reddy., is/are the true & first inventor(s) for this invention and declare that the applicant(s) herein is/are my/our assignee or legal representative.




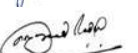
(i) that I/We have not made any application for the same/substantially the same invention outside India.

OR

(ii) that I/We who have made this application No.....datedalone/jointly with....., made for the same/substantially same invention, application(s) for patent in the other countries, the particulars of which are given below:

Name of the country	Date of application	Application No.	Status of the application	Date of publication	Date of grant
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<p>3. Name and address of the assignee</p>	<p>(iii)that the rights in the application(s) has/have been assigned to..... that I/We undertake that upto the date of grant of the patent by the Controller, I/We would keep him informed in writing the details regarding corresponding applications for patents filed outside India within six months from the date of filing of such application. Dated this: 12th November, 2020</p>
<p>4. To be signed by the applicant or his authorized registered patent agent.</p>	<p>Signature:..... Prof.M.James Stephen  Mr.Sreekanth Puli  Mr.Padala Pushkal  Prof. P.V.G.D. Prasad Reddy </p>

<p>5. Name of the natural person who has Signed.</p>	<p>Prof.M.James Stephen  Mr.Sreekanth Puli  Mr.Padala Pushkal  Prof. P.V.G.D. Prasad Reddy </p>
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To
The Controller of Patents
The Patent office at CHENNAI

FORM 5

THE PATENT ACT, 1970

(39 OF 1970) &
The Patent Rules, 2003

DECLARATION AS TO INVENTORSHIP

[See sections 10(6) and Rule 13(6)]

1. NAME OF APPLICANT(S):

Sr.No	Name	Nationality	Address	Country	State
1	Prof.M.James Stephen	India	Professor, Department of CSE, Welfare Institute of Science Technology and Management (WISTM), Visakhapatnam, Andhra Pradesh, India. Pin Code:530007	India	Andhra Pradesh
2	Mr.Sreekanth Puli	India	Research Scholar, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh
3	Mr.Padala Pushkal	India	Department of CSE, The National Institute of Engineering, Mysore, Karnataka, India. Pin Code: 570008	India	Karnataka
4	Prof. P.V.G.D. Prasad Reddy	India	Senior Professor, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh

I/We Prof.M.James Stephen, Mr.Sreekanth Puli, Mr.Padala Pushkal, Prof. P.V.G.D. Prasad Reddy, hereby declare that the true and first inventor(s) of the invention disclosed in the complete specification filed in pursuance of my/our application numbered.....dated is/are:

2. INVENTOR(s):

Sr.No	Name	Nationality	Address	Country	State
1	Prof.M.James Stephen	India	Professor, Department of CSE, Wellfare Institute of Science Technology and Management (WISTM), Visakhapatnam, Andhra Pradesh, India. Pin Code:530007	India	Andhra Pradesh
2	Mr.Sreekanth Puli	India	Research Scholar, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh
3	Mr.Padala Pushkal	India	Department of CSE, The National Institute of Engineering, Mysore, Karnataka, India. Pin Code: 570008	India	Karnataka
4	Prof. P.V.G.D. Prasad Reddy	India	Senior Professor, Department of CS & SE, A.U. College of Engineering, Andhra University, Visakhapatnam, Andhra Pradesh, India. Pin Code:530003	India	Andhra Pradesh

Dated this...12th day of November 2020

Name of the Signatory

Signature:-

Prof.M.James Stephen



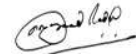
Mr.Sreekanth Puli



Mr.Padala Pushkal



Prof. P.V.G.D. Prasad Reddy

**3. DECLARATION TO BE GIVEN WHEN THE APPLICATION IN INDIA IS FILED BY THE APPLICANT (S) IN THE CONVENTION COUNTRY:-**

~~We the applicant(s) in the convention country hereby declare that our right to apply for a patent in India is by way of assignment from the true and first inventor(s).~~

Dated thisday of 2020

Signature:-

Name of Signatory:-

4. STATEMENT (to be signed by the additional inventor(s) not mentioned in the application form)

~~I/we assent to invention referred to in the above declaration, being included in the complete specification filed in pursuance of the stated application.~~

~~Dated thisday of 2020~~

~~Signature of the additional inventor (s)~~

~~Name :~~

To

The Controller of Patents

The Patent office at CHENNAI