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CBR Detail:

Sr. No.	Ref. No./Application No.	App. Number	Amount Paid	C.B.R. No.	Form Name	Remarks
1	202121023712	TEMP/E-1/26328/2021-MUM	1600	12171	FORM 1	THE SMART SYSTEM FOR MEDICAL IMAGE VIEWING BY USING ARTIFICIAL INTELLIGENCE NEURAL NETWORK

TransactionID	Payment Mode	Challan Identification Number	Amount Paid	Head of A/C No
N-0000807358	Online Bank Transfer	2705210007861	1600.00	1475001020000001

Total Amount : ₹ 1600
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WAGHODIYA ROAD

CBR Detail:

Sr. No.	Ref. No./Application No.	App. Number	Amount Paid	C.B.R. No.	Form Name	Remarks
1	E-12/780/2021/MUM	202121023712	2500	12173	FORM 9	

TransactionID	Payment Mode	Challan Identification Number	Amount Paid	Head of A/C No
N-0000807372	Online Bank Transfer	2705210007958	2500.00	1475001020000001

Total Amount : ₹ 2500
Amount in Words: Rupees Two Thousand Five Hundred Only

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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:

1. APPLICANT'S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)

2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]

Ordinary (✓)		Convention ( )		PCT-NP ( )	
Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )

3A. APPLICANT(S)

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			State	
			Country	Ethiopia
			Pin Code	

Natural Person (✓)	Other than Natural Person		
	Small Entity ( )	Startup ( )	Others ( )

4. INVENTOR(S) [Please tick (✓) at the appropriate category]

Are all the inventor(s) same as the applicant(s) named above?	Yes (✓)	No ()

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			City	Hyderabad
			State	Telangana
			Country	INDIA
			Pin Code	501401
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			Pin Code	607103
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			City	Delhi
			State	Delhi
			Country	INDIA
			Pin Code	100010
Jemal Mohammed Amin	Ethiopia		Lecturer, Department Of Electrical And Computer Engineering,132, Samara University, Samara, Afar Regional State	
			City	
			State	
			Country	Ethiopia
			Pin Code	

5. TITLE OF THE INVENTION: "THE SMART SYSTEM FOR MEDICAL IMAGE VIEWING BY USING ARTIFICIAL INTELLIGENCE NEURAL NETWORK."

6. AUTHORISED REGISTERED PATENT AGENT(S)	IN/PA No.	3145
	Name	Pratik Vora
	Mobile No.	
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	Fax. No.	
	E-mail ID	iprmaulesh@outlook.com

8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION

Country	Application Number	Filing Date	Name of the Applicant	Title of the Invention	IPC(as classified in the convention country)

9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)

International Application Number	International filing date

10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION

Original (first) application No.	Date of filing of original (first) application

11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT

Main Application/Patent Number	Date of filing of main application

12. DECLARATIONS

(i) Declaration by the inventor(s)

(In case the applicant is an assignee: the inventor(s) may sign herein below or the applicant may upload the assignment or enclose the assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period).

I / We, the above named inventor(s) 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 :
(b) Signature :
(c) Name : **Rajeshwari R**

(a) Date :
(b) Signature :
(c) Name : **Rajat Kapila**

(a) Date :
(b) Signature :
(c) Name : **Dr. Shubhajit Halder**

(a) Date :
(b) Signature :
(c) Name : **Dr. Rachna Kohar**

(a) Date :
(b) Signature :
(c) Name : **Dr. S. Poongodi**

(a) Date :
(b) Signature :
(c) Name : **Amit Kumar**

(a) Date :
(b) Signature :
(c) Name : **Chhaya Nayak**

(a) Date :
(b) Signature :
(c) Name : **Anandan. D**

(a) Date :
(b) Signature :
(c) Name : **Anuj Kumar**

(a) Date :
(b) Signature :
(c) Name : **Jemal Mohammed Amin**

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

(In case the applicant in India is different than the applicant in the convention country: the applicant in the convention country may sign herein below or applicant in India may upload the assignment from the applicant in the convention country or enclose the said assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period).

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 :	(a) Date :
(b) Signature :	(b) Signature :
(c) Name :	(c) Name :

(iii)Declaration by the Applicant(s)

I/We, the applicant(s) hereby declare(s) that :-

☑ I am/We are in possession of the above-mentioned invention.

☑ The provisional/complete specification relating to the invention is filed with this application.

☒ The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me /us before the grant of patent to me/us.

☑ There is no lawful ground of objection(s) to the grant of the Patent to me/ us.

☒ I am /We are the true & first inventor(s).

☑ I am /We are the assignee or legal representative of true & first inventor(s).

☒ The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of my/our invention(s).

☒ I/We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.

☒ My/our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.

☑ The application is divided out of my/our application particulars of which is given in Paragraph-10 and pray that this application may be treated as deemed to have been filed on _____. under section 16 of the Act.

☒ The said invention is an improvement in or modification of the invention particulars of which are given in Para-11.

13.FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

a. Form 2

Item	Details	Fee	Remarks
Complete Specification	No.of pages. **22**	1600/-	
No. of Claim(s)	No. of claims. **10** and No. of pages. **04**		
Abstract	No.of pages. **01**		
No. of Drawing(s)	No. of drawings. **02** and No. of pages. **02**		

☑ Complete specification (in conformation with the international application) / as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies), No. of pages _____, No. of claims_____.

☒ Sequence listing in electronic form

☑ Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies), No. of sheets _____

☒ Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.

☒ Translation of priority document/Specification/International Search Report/International Preliminary Report on Patentability.

☑ Statement and Undertaking on Form 3

☑ Declaration of inventorship on Form 5

☒ Power of Authority

Total fee Rs. 1600/- in online Date 25/05/2021.

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 25th May 2021.

Signature
Name: - Pratik Vora
Agent No:- IN/PA 3145

To,
The Controller of Patents
The Indian Patent Office, Mumbai/Chennai/New Delhi/ Kolkata

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 – "THE SMART SYSTEM FOR MEDICAL IMAGE VIEWING BY USING ARTIFICIAL INTELLIGENCE NEURAL NETWORK."**

2. Applicant(s)

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a) **NAME:** Dr. S. Poongodi
b) **NATIONALITY**: An INDIAN

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a) **NAME:**	Amit Kumar
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c) **ADDRESS:**	Associate Professor, Department Of Electronics, Bhaskaracharya College Of Applied Sciences (University Of Delhi), Sector-2, Dwarka, South West Delhi – 110075, Delhi, India.
a) **NAME:**	Chhaya Nayak
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c) **ADDRESS:**	Assistant Professor, Department Of Computer Science, G H Raisoni College Of Engineering & Management, Pune, Maharashtra, India
a) **NAME:**	Anandan.D
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c) **ADDRESS:**	Assistant Professor, Department Of CSE, 243/3,Main Road, Keezhakuppam, Nadukuppam(P.O), Panruti (T.K), Cuddalore (Dist),TN-607103, Tamil Nadu.
a) **NAME:**	Anuj Kumar
b) **NATIONALITY**:	An INDIAN
c) **ADDRESS:**	Assistant Professor, Department Of Management, I-25/2, Street No-10, Brahampuri, Delhi – 53, India.
a) **NAME:**	Jemal Mohammed Amin
b) **NATIONALITY**:	An
c) **ADDRESS:**	Lecturer, Department Of Electrical And Computer Engineering,132, Samara University, Samara, Afar Regional State, Ethiopia

3. **PREAMBLE TO THE DESCRIPTION**:

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

FIELD OF THE INVENTION

The present invention relates to generally to the field of medical data. More especially, the present specification is associated with systems and strategies for storing, processing, accessing and viewing medical photo records by means of presenting an stop-to-quit structure that allows the speedy synchronization of snap shots, efficient rendering of images on cellular gadgets, application of photograph processing functions in a cloud computing environment, education and application of neural community analyses on photographs, and upkeep and communique of kingdom statistics for modified photographs, among other functions.

BACKGROUND OF THE INVENTION

Physicians depend upon scientific image data acquired the usage of medical imaging gadgets, along with X-ray structures, MRI structures, ultrasound systems, or computed tomography (CT) structures, to make diagnoses or music the development of a health country of the affected person. Conventionally, a medical doctor prescribes one or extra of the aforementioned imaging modalities to a affected person. Following the prescription, a affected person is subjected to at least one or more of the aforementioned imaging modalities, a technician captures the requested pictures, and a medical doctor or specialized technician analyses the captured pictures and generates an photograph interpretation record, assuming the image has enough fine to accomplish that. The photograph interpretation record, accompanied by associated medical pictures, is then despatched to the asking for physician.

This traditional imaging system has many shortcomings. First, conventionally, such processing or rendering functions are performed the usage of pc workstations which might be domestically networked with an image storage device and/or the imaging modalities. However, there are numerous limitations to a pc-based processing of clinical pics. For instance, the hardware and software program concerned with those workstations are pricey and require complicated and time consuming installations and upkeep. Because the notebook can most effective live in a single place, physicians or technicians need to physically visit the pc, often in a hospital or sanatorium, to apply the photo processing software and gear, thereby

hindering their potential to work remotely. Such limitations might be doubtlessly lifestyles threatening within the case of viral pandemic.

Another assuming this conventional imaging technique is implemented the use of a customer-server based architecture that does aid the usage of viewing applications executing on far off clients, such viewing packages have a tendency to be “skinny customers” in which the snap shots are rendered on the server and the rendered photographs are then transmitted and displayed on the viewing applications. This calls for the allocation of extra computational resources on the server, will increase the fee and complexity of server preservation, and boundaries the quantity of simultaneous users that can be accommodated.

Other one physicians often desire to share a particular view of an photograph with the affected person or another health practitioner. For example, at some point of her review, a medical doctor may additionally manipulate an image with the aid of zooming into a particular portion of the photograph, translating the image, rotating the photograph, or highlighting a portion of the photograph. The health practitioner may also then wish to share this specific kingdom of the picture with a affected person. Storing and sharing a changed picture, however, is tough to do in modern structures, which generally do now not allow visible kingdom statistics to be maintained after an photograph is closed with the intention to avoid complexities with picture synchronization

Another one, clinical institutions need to enjoy the technical and financial efficiencies of cloud computing but doing so often runs counter to the consumer-server architectures that have been conventionally carried out. Maintaining photo synchronization, mainly when multiple users have get entry to to, and may potentially adjust, the equal images, is hard, as mentioned above. There is a capability for photo facts units associated with a unmarried affected person to be dispensed throughout multiple one-of-a-kind cloud computing structures. Creating a single, cohesive view of such disbursed picture facts units is presently hard to obtain, specially where some cloud structures understand a selected photograph format at the same time as different cloud structures do not recognize or save snap shots

inside the equal format.

Other one, prior to the diagnostic interpretation or studying of the clinical pix and/or in the course of the health practitioner's interplay with the medical pictures, the scientific photographs may be processed the use of a selection of processing or rendering capabilities. Advanced processing features are frequently computationally intensive and, in a traditional consumer-server structure, require dedicating a vast amount of server sources, on a fixed-basis, to capabilities which may additionally, or might not, be applied at a given time. This frequently limits the medical institution's ability to flexibly practice numerous photo processing capabilities if and while wanted with the aid of a health practitioner.

Another one, present scientific photo garage, distribution, and viewing systems do no longer permit the software of superior services, which includes neural network analyses and sensible, tailor-made advertising, on a actual-time, on call for basis. For instance, conventional commercial platforms are constructed on static content. The conventional commercial platforms analyze the content of the internet page ahead of time and that they offer, on call for, commercials based on the text determined.

SUMMARY OF THE INVENTION

The main aspect of the present invention comprising collection of virtual photographs and in which the first series of digital photos are associated with most effective one individual and generated through simplest one imaging modality of a plurality of imaging modalities, the gadget comprising: a syncing utility, wherein the syncing application is configured to execute inside a neighborhood area community and in which the syncing application is in records conversation with at the least one of the plurality of imaging modalities and/or as a minimum one in all a plurality of computing gadgets configured to show pix generated with the aid of each of the plurality of imaging modalities; as a minimum one server adapted to be outside to the local region network and in records verbal exchange with the syncing application; and at least one purchaser-aspect viewing utility adapted to be hooked up on one or greater of

stated plurality of computing gadgets external to the nearby vicinity network, in which the customer-facet viewing software is configured to: gather at least one of the one or greater research, including therein unrendered information representative of the digital photos of the primary collection, from the at least one server; locally render said unrendered facts within the one or extra of stated plurality of computing devices; and enable a user to manipulate at least one of the virtual pix.

Another aspect of the present invention comprising as a minimum one consumer-facet viewing application is configured to transmit the manipulated at the least one virtual image again to the at the least one server and in which the at the least one server is configured to broadcast an availability of the manipulated at least one virtual photo to the syncing software.

Other aspect of the present invention comprising one client-side viewing utility is configured to transmit the manipulated at the least one digital picture again to the at least one server and in which the syncing utility is configured to automatically gather the manipulated at least one virtual photograph from the at the least one server.

One of the aspect of the present invention comprising The machine similarly comprises at least one photograph storage device in the local vicinity community, wherein the syncing application is configured to be a sole gateway to having access to the digital pix, stored within the at the least one picture storage system, out of doors of the local region community. It should be liked that having the syncing utility configured to be a sole gateway to accessing the digital pics, stored within the at the least one photo storage device, out of doors of the local place network is non-compulsory. In any other embodiment, the syncing software is configured to be one in every of several gateways to gaining access to the digital photographs, stored inside the at least one photograph storage system, out of doors of the local vicinity community.

Another aspect of the present invention comprising the only or extra studies incorporates a second collection of digital photographs, wherein the virtual images of the second series is

handiest associated with stated one character and generated with the aid of a second imaging modality of the plurality of imaging modalities, and in which the second one imaging modality is one of a kind than the one imaging modality. It should be liked that, in another embodiment, the first and 2d series of virtual images are associated with the identical man or woman and are generated with the aid of the identical imaging modalities, however at distinct times, which include on one of a kind days.

Other aspect of the present invention comprising the one imaging modality of the primary series is one among an X-ray scanning machine, an ultrasound imaging machine, a fluorescence-based imaging device, a mammography gadget, a positron emission tomography machine, a molecular imaging machine, a MM gadget, or a CT device and in which the second one imaging modality is a extraordinary one of the X-ray scanning machine, the ultrasound imaging gadget, the fluorescence-primarily based imaging system, the mammography device, the positron emission tomography gadget, the molecular imaging system, the MM device, or the CT device.

Another aspect of the present invention comprising the one imaging modality of the first series is one of an X-ray scanning system, an ultrasound imaging system, a fluorescence-based imaging system, a mammography system, a positron emission tomography system, a molecular imaging system, a MM system, or a CT system and wherein the second imaging modality is a different one of the X-ray scanning system, the ultrasound imaging system, the fluorescence-based imaging system, the mammography system, the positron emission tomography system, the molecular imaging system, the MM system, or the CT system.

Other aspect of the present invention at the least one imaging garage gadget in the local location network, in which the syncing utility is configured to robotically acquire and transmit every of the virtual images to the at the least one server upon every of the virtual images being saved within the as a minimum one imaging gadget.

Another aspect of the present invention comprising At least one server is configured to

routinely observe an image processing function to each of the digital images upon receiving each of the digital photographs, in which the photo processing characteristic is configured to decide a resolution of every of the digital images, wherein the picture processing function is configured to generate a notification if the decision suggests that the picture is below a predefined quality level, and wherein the as a minimum one server is configured to cause the notification to be transmitted to the only imaging modality answerable for producing the virtual image to which the photograph processing feature was implemented.

Other aspect of the present invention comprising The first collection is a computed tomography collection comprising the digital pix and in which the client-facet viewing software is configured to allow the user to manipulate at the least one of the virtual pictures with the aid of selecting one of the digital photos and applying a degree of zoom to the selected one of the digital snap shots. Optionally, the patron-facet viewing software is configured to transmit the selected one of the digital photos, after manipulation via the user, to the as a minimum one server and wherein the at the least one server is configured to mechanically save the chosen one of the digital pix in a manipulated nation as a separate file from the selected one of the virtual pictures in a non-manipulated country. Optionally, the at the least one server is configured to broadcast a digital cope with of the stored selected one of the virtual pix within the manipulated kingdom. Optionally, the syncing utility is configured to query the at the least one server for an existence of recent digital pictures and in which, in reaction, the as a minimum one server is configured to transmit a virtual cope with of the saved selected one of the virtual images inside the manipulated country.

It will be apparent to persons of skill in the art that various of the foregoing aspects and/or objects, and various other aspects and/or objects disclosed herein, can be incorporated and/or achieved separately or combined in a single device, method, system, composition, article of manufacture, and/or improvement thereof, thus obtaining the benefit of more than one aspect and/or object, and that an embodiment may encompass none, one, or more than one but less than all of the aspects, objects, or features enumerated in the foregoing summary or otherwise disclosed herein. The disclosure hereof extends to all such combinations. In addition to the

illustrative aspects, embodiments, objects, and features described above, further aspects, embodiments, objects, and features will become apparent by reference to the drawing figures and detailed description. Also disclosed herein are various embodiments of related methods, devices, apparatus, compositions, systems, articles of manufacture, and/or improvements thereof. The foregoing summary is intended to provide a brief introduction to the subject matter of this disclosure and does not in any way limit or circumscribe the scope of the invention(s) disclosed herein, which scope is defined by the claims currently appended or as they may be amended, and as interpreted by a skilled artisan in the light of the entire disclosure.

BRIEF DESCRIPTION OF DRAWINGS

The summary, as well as the following detailed description, is further understood when read in conjunction with the appended drawings. For the purpose of illustrating the invention, there are shown in the drawing's exemplary embodiments of the invention; however, the invention is not limited to the specific methods, compositions, and devices disclosed. In addition, the drawings are not necessarily drawn to scale. In the drawings:

The detailed description is set forth with reference to the accompanying drawings. The drawings are provided for purposes of illustration only and merely depict example embodiments of the disclosure. The drawings are provided to facilitate understanding of the disclosure and shall not be deemed to limit the breadth, scope, or applicability of the disclosure. The use of the same reference numerals indicates similar, but not necessarily the same or identical components. However, different reference numerals may be used to identify similar components as well. Various embodiments may utilize elements or components other than those illustrated in the drawings, and some elements and/or components may not be present in various embodiments. The use of singular terminology to describe a component or element may, depending on the context, encompass a plural number of such components or elements and vice versa.

Repeat use of reference characters in the present specification and drawings is intended to represent the same or analogous features or elements of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Embodiments, of the present disclosure, will now be described with reference to the accompanying drawings.

Embodiments are provided so as to thoroughly and fully convey the scope of the present disclosure to the person skilled in the art. Numerous details are set forth, relating to specific components, and methods, to provide a complete understanding of embodiments of the present disclosure. It will be apparent to the person skilled in the art that the details provided in the embodiments should not be construed to limit the scope of the present disclosure. In some embodiments, well-known processes, well-known apparatus structures, and well-known techniques are not described in detail.

The terminology used, in the present disclosure, is only for the purpose of explaining a particular embodiment and such terminology shall not be considered to limit the scope of the present disclosure. As used in the present disclosure, the forms "a," "an," and "the" may be intended to include the plural forms as well, unless the context clearly suggests otherwise. The terms "comprises," "comprising," "including," and "having," are open ended transitional phrases and therefore specify the presence of stated features, integers, steps, operations, elements, modules, units and/or components, but do not forbid the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof. The particular order of steps disclosed in the method and process of the present disclosure is not to be construed as necessarily requiring their performance as described or illustrated. It is also to be understood that additional or alternative steps may be employed.

Digital Imaging and Communications in Medicine (DICOM) is the international fashionable

for clinical images and associated information. It defines the codecs for medical photos that can be exchanged with the records and best essential for scientific use. DICOM is applied in maximum radiology, cardiology imaging, and radiotherapy gadgets (X-ray, CT, MM, ultrasound, and so forth.), and increasingly in devices in different scientific domains which includes ophthalmology and dentistry. A DICOM information object incorporates a number of attributes, consisting of items along with patient call and ID, and additionally a special characteristic containing the photograph pixel statistics. A single DICOM object has best one attribute containing pixel information. For many modalities, this corresponds to a unmarried picture. However, the attribute might also contain multiple “frames”, permitting garage of cine loops or other multi-frame records. In these cases, 3- or four-dimensional statistics may be encapsulated in a single DICOM item. Pixel information can be compressed the use of a selection of standards, which includes JPEG, Lossless JPEG, JPEG 2000, and Run-duration encoding (RLE).

The DICOM preferred gives some limited offerings, such as a garage carrier to ship images or other chronic objects (dependent reviews, and many others.) to a photograph archiving and verbal exchange machine (PACS) or laptop. PACS is used to securely save and digitally transmit clinical photographs. Medical documentation and pictures are commonly housed in off-website online servers and accessed using PACS workstations. PACS has 4 foremost additives: hardware imaging machines, a relaxed community for the distribution and trade of affected person pictures, a computing device or mobile device for viewing, processing and interpreting pix, and digital archives for storing and retrieving snap shots and associated documentation and reviews.

The time period “collection” refers to an organized mixture of virtual photographs. For instance, a CT scan is described by using a sequence, that's a set of associated digital photographs. Similarly, a PET test is defined by means of a chain, which is a fixed of associated virtual images. Various series may be mixed right into a “have a look at” related to a affected person. Typically, a health practitioner may contemporaneously order numerous exams that could yield different collection (PET experiment is one series, CT experiment is

any other collection, as an example) and people collection can be organized right into a have a look at precise to the patient for whom the orders had been made. The time period “priors” refers to preceding research that were finished for that patient. It have to be liked that a sequence is usually described by using a single imaging modality (which include a CT system, X-ray machine, ultrasound system, MRI device) on the subject of a unmarried affected person. A series may also be in addition defined with the aid of anatomy. For instance, all axial photographs acquisitions of the chest may be grouped in a single series, at the same time as all mind picture acquisitions may be grouped right into a second collection. Furthermore, different criteria may be used to institution pictures into series, for example acquisitions with and with out evaluation sellers can be grouped into unique collection. In all cases, but, a chain contains pictures generated by means of a single imaging modality with regards to a single affected person and a observe accommodates photos associated with a unmarried patient.

The main embodiment and architecture of the present Fig 1 disclose the one or more imaging devices or modalities incorporate one of an X-ray scanning system, an ultrasound imaging system, a fluorescence-based imaging device, a mammography gadget, a positron emission tomography gadget, a molecular imaging device, a MRI device, a CT device, radiological information structures (RIS), or different acquisition systems that generate clinical photos and related records.

User computing devices may include computing gadgets inclusive of computers, laptops, non-public digital assistants (PDAs), mobile phones, or another stressed or wireless computing tool that enables users which include patients, medical doctors, and associated employees to view DICOM information, view Electronic Medical Records (EMRs), and specifically in accordance with the various embodiments of the existing specification, view aggregated DICOM records generated from multiple resources consisting of a couple of gadgets , clinical imaging devices , which may be a computed tomography (CT) scanner or X-ray scanner as an instance, and from a couple of cloud platforms such as, as an example, first and second cloud computing structures or structures.

The consumer computing gadgets may include functionalities to show a list of pix to the user running a tool and permit choice (person input) of the photographs to show. Devices are also configured to retrieve the facts requested, which may also consist of images, user alternatives and likely other facts to be had, and perform manipulation of the pics displayed as asked by means of the consumer. The manipulation of photos may additionally involve, for instance, panning, zooming, adjusting the comparison, annotating, or any other type of photo manipulation.

Accordingly, in a few embodiments, a few or all the person computing devices have a purchaser-aspect viewing software mounted this is configured to generate one or extra GUIs (Graphical User Interfaces) that render, and permit a user to view and manage, DICOM information (along with photographs and EMRs, for example) on a display related to each of the consumer computing gadgets . In a few embodiments, the client-aspect viewing utility makes use of a web browser using HTML to display the DICOM photographs. In some embodiments, a few or all the user computing devices may additionally have a legacy browser application, including, for example, Internet Explorer or Google Chrome, to permit a person to view DICOM data. However, unlike the novel consumer-aspect viewing packages disclosed herein, these legacy browser packages do not have the functionalities to allow the user to render and then manage the locally rendered DICOM records.

In accordance with some components of the existing specification, the one or extra computing devices, clinical imaging devices at the side of a caching and syncing device and as a minimum one photograph garage system are in statistics communication with every other over a nearby location community (LAN). In embodiments, the tool has a caching and syncing application set up that is configured to execute in the neighborhood location network thereby placing the caching and syncing utility in statistics verbal exchange with the one or more computing gadgets , clinical imaging gadgets and the at the least one picture storage gadget . In a few embodiments, the at least one image garage gadget is DICOM compliant. In a few embodiments, the LAN implements a community security device or firewall. In

various embodiments, the LAN may be associated with a care-giving facility which includes a health facility, a affected person scanning facility or some other hospital treatment center as could be evident to humans of ordinary ability within the artwork.

In accordance with another thing of the present specification, the caching and syncing tool is in data conversation with as a minimum one server this is adapted to be outside to the LAN. Similarly, the only or more person computing devices are also in statistics communication with the at the least one server. In various embodiments, the caching and syncing device and the one or extra user computing devices are in facts verbal exchange with the at least one server over a private or public network (inclusive of the Internet). In some embodiments, the at the least one server is in information verbal exchange with the first and second cloud computing platforms or structures.

In embodiments, the caching and syncing device is configured as a sole gateway to allow operators and/or customers of the only or greater computing gadgets and medical imaging gadgets to talk (get entry to/retrieve and/or add/shop) DICOM facts with the first and second cloud computing systems or structures , thru the at the least one server . It need to be favored, but, that during a few embodiments, the as a minimum one server is carried out in the cloud structures, (along with the first layer of the cloud computing machine of FIG. 1). Alternatively, in a few embodiments, the at least one server may be a devoted standalone server (that isn't in statistics communique with a cloud platform).

In some embodiments, the as a minimum one server accommodates a plurality of processing cores and wherein each of the plurality of processing cores is customized to simultaneously host as a minimum separate users at the same time as each of the separate users is executing as a minimum one rendering operation the usage of at the least ten separate times of at least one consumer-aspect viewing utility.

In embodiments, the primary cloud computing platform or gadget gives a plurality of programmatic offerings that assist the DICOM protocol whilst the second cloud computing platform or machine affords a plurality of programmatic offerings that don't guide DICOM

protocol. Platforms that assist the DICOM protocol are configured to execute DICOMWeb, that's the DICOM fashionable for internet-based totally clinical imaging. DICOMWeb may be implemented at once or as a proxy to DICOM message service element (DEVISE) offerings to offer internet-based get admission to to DICOM-enabled structures. Examples of cloud systems encompass Google Cloud Platform (GCP) and Microsoft Azure. In situations wherein a cloud platform does no longer offer or implement a DICOM protocol, the cloud platform may, instead, provide an application application interface that may be tailored and utilized by the as a minimum one server . Examples of cloud structures that do not implement a DICOM protocol consist of, for example, Amazon Web Services (AWS). In implementations, therefore, the caching and syncing application can also interface with the at the least one server that in flip may interface with the primary cloud computing platform which includes Google Cloud Platform (GCP), Microsoft Azure and/or with the second cloud computing platform such as Amazon Simple Storage Service (S) API for storage, in accordance with the numerous embodiments of the prevailing specification. In every other embodiment, the caching and syncing tool incorporates the server this is answerable for communicating with one or more servers configured to use a DICOM Web application programming interface and with one or more servers configured to apply an software programming interface that is not DICOM Web or DICOM Web well suited. Furthermore, the caching and syncing tool accommodates the server this is liable for converting records between a) one or greater servers configured to use a DICOM Web software programming interface and b) one or extra servers configured to use an software programming interface that isn't DICOM Web or DICOM Web well suited. It must be liked that the server can be an software inside the caching and syncing tool , a part of the caching and syncing utility , or a separate, standalone bodily server or community of servers.

The first cloud computing platform or machine can also encompass a DICOM archive . The DICOM archive is configured to store instances of DICOM statistics inside the cloud. The archive is configured to consolidate disparate or fragmented imaging structures into one repository, increase data integrity and allow and simplify get entry to to affected person medical facts and photos through devices . Different styles of archive answers can be

available for DICOM records on distinct cloud systems and . It must be referred to that embodiments of the existing specification can be relevant to other types of pix aside from DICOM images; accordingly, DICOM pix are cited herein by means of example most effective. Similar to DICOM archive , cloud platforms encompass file garage to store DICOM facts thru, and in accordance with, their APIs.

The first and 2d cloud systems , interface with offerings together with offerings and , respectively, which generate statistics representative of HTML pages for show inside the client-aspect viewing applications or legacy browsers of consumer computing gadgets , as well as imparting discrete functionalities inclusive of storing/retrieving person choices, imposing security, and helping system learning (ML) offerings. Once meta records is parsed from the DICOM pics and stored into items that can be supplied to, and inside, a patron-side viewing application or legacy browser, to be able to provide the user with a version of the DICOM picture this is viewable within the consumer-side viewing software or legacy browser at person tool , pixel data from the DICOM image is converted into an internet digestible format by using offerings and .

In various embodiments, the offerings may be implemented within the as a minimum one server or its functionalities are brought to the cloud platform the use of serverless technologies. The programmatic commands comprising offerings can be configured to perform consumer validation, safety and storing/retrieval of user alternatives. The programmatic commands comprising services may be further configured to carry out records conversion from DICOM Web, consisting of as an example to generate picture thumbnails, and caching of the facts, to index files in garage such that customers of gadgets can retrieve the pics in a short quantity of time, to transform information for the images in document garage such that the content may be displayed via the client-facet viewing application or legacy browser in device , and/or to carry out caching of the facts converted to improve performances.

Another embodiment of the present invention comprising in some embodiments, offerings

and are carried out within cloud systems and , respectively, as serverless technologies. Alternatively, services and are implemented on separate and discrete servers, including on at the least one server , that get admission to the cloud services on platforms and , through DICOMWeb and APIs. If carried out as a serverless generation, the programmatic instructions comprising offerings , are organized as a chain of discrete feature calls that, whilst a request is received from a person tool , a function call is configured to decide the character of the received request and to name upon, or instantiate, a plurality of programmatic instructions, prepared as modules or features, from the cloud structures , based upon the character of the obtained request. This stands in assessment with a separate and discrete server, which include the at least one server , which is configured to execute an utility to deal with the obtained request and no longer distribute that computational procedure to the cloud platform.

In diverse embodiments, upon receiving a request for a observe from a device , the use of serverless technology, the provider performs the following movements:

a) Validates if the requesting person at the device has a permission to get entry to the have a look at requested;

b) Writes in an get right of entry to log that the user at the device is gaining access to the have a look at. The get admission to log itself may be applied the usage of serverless technologies, in some embodiments, for example:

i) Using serverless databases which include DynamoDB in AWS or Firebase in GCP

ii) Using log services from the cloud company along with CloudWatch in AWS or Stackdriver Logging in GCP

c) Gain the have a look at requested with the aid of the device from the cloud archive using DicomWeb protocol;

d) Post-technique the pictures received, such as:

i) Separating DICOM Tags from pixel information

ii) Generating a thumbnail illustration of the DICOM photograph

iii) Generating a JPEG illustration of the DICOM photo

iv) Compressing the DICOM pixel facts

e) Keep the facts generate in step d in a location which may be accessed by a patron-facet viewing software (such as inside the Web Cache of FIG. B).

f) Offer to the purchaser-side viewing software the credential to get entry to the facts saved.

Similarly, services can be carried out by way of within the at the least one server or its functionalities are introduced to the cloud platform the usage of serverless technologies. The programmatic instructions comprising services can be configured to perform user validation, safety and storing/retrieval of user choices. The programmatic commands comprising services may be further configured to carry out records manipulations, inclusive of for example generating photo thumbnails or caching of the records, to index files in garage such that users of devices can retrieve the photos in a quick amount of time, to convert records for the snap shots in record storage such that the content material can be displayed by means of the consumer-aspect viewing software or legacy browser in tool , and/or to perform caching of the statistics transformed to improve performances.

Throughout this specification the word “comprises”, or variations such as “comprises” or “comprising”, will be understood to imply the inclusion of a stated element, step, or group of elements, steps, but not the exclusion of any other element, step, or group of elements, or steps.

FIG. 2 is a block diagram illustration of a serverless cloud computing surroundings or device running as a FaaS (function-as-a-provider) platform to offer picture storage, access and processing offerings, in accordance with a few embodiments of the present specification. In embodiments, the serverless cloud computing device is configured to activate, put into effect or execute a plurality of instructions or programmatic code in devices of features in response

to as a minimum one event inclusive of, for instance, a person's command/request.

In a few embodiments, the device accommodates a the front-end first layer , a mission scheduling 2d layer , an execution third layer , a again-quit database or archiving fourth layer and an infrastructure 5th layer .

The front-stop first layer accommodates a web server that, in a few embodiments, may additionally host a clinical image archiving and viewing website for get right of entry to by means of at least one consumer computing tool walking a purchaser-facet viewing software and by means of a caching and syncing tool running a caching and syncing software . It have to be appreciated that even as in a few embodiments the web server is applied within the cloud computing surroundings (as the first layer), in exchange embodiments, the net server is implemented on at least one separate and discrete server (inclusive of, the at the least one server of FIG. 1 and 2) that interfaces with the cloud computing surroundings .

In some embodiments, the purchaser-side viewing utility generates and gives at least one GUI to enable a person to switch medical photos for garage/archiving and get entry to clinical pictures stored/archived inside the returned-cease database or archiving fourth layer for rendering within the at least one GUI. Similarly, the caching and syncing utility enables transmission of medical pictures for storage/archiving and accessing medical pix stored/archived inside the back-end database or archiving fourth layer .

In embodiments, scientific photos are either processed within the execution 1/3 layer before being transferred to the at the least one person computing device and/or are processed within the at the least one consumer computing tool before being rendered inside the as a minimum one GUI generated by way of the customer-side viewing software . It need to be favored that the medical images, that may be retrieved and rendered for show the use of a purchaser-side viewing software on the at the least one person computing device , can be related to at the least one ‘series’ in which a plurality of series can be a part of a ‘examine’ associated with a patient.

In embodiments, the as a minimum one person computing device and the caching and syncing device are in information verbal exchange with the net server thru a stressed and/or wireless network that can be non-public or public which includes the Internet. User request (generated from the as a minimum one computing device and/or from the caching and syncing tool), for storing, gaining access to and executing at least one feature for processing clinical snap shots, is received at the internet server .

In a few embodiments, the challenge scheduling second layer contains a controller and a load balancer . The web server communicates the person request, along with, as an instance, for executing at the least one characteristic, to the controller and receives a end result, which include, as an instance, of execution of the as a minimum one feature, from the controller for communicating to the as a minimum one computing tool and/or to the caching and syncing tool . The user request is communicated by the controller to the weight balancer that allocates a process or venture associated with the user request to an execution environment within the third layer .

Persons of normal talent within the art would recognize that the weight balancer , in a few embodiments, is a software program program liable for the distribution of responsibilities, jobs or workloads, corresponding to consumer requests, across the plurality of present and/or newly released execution environments - n that during turn are virtual computing times of a plurality of hardware assets in the infrastructure 5th layer .

In embodiments, the infrastructure 5th layer contains hardware sources which includes, however now not restricted to, a plurality of computing assets (consisting of, for instance, one or extra host servers), a plurality of garage resources (including, as an example, one or more storage array structures, inclusive of SAN), and a plurality of networking resources. The hardware sources are configured to permit functionalities corresponding to the layers,and . In various embodiments, the plurality of computing sources may be constructed on server grade hardware systems that each include traditional additives of a computing device, which includes one or extra processors, device reminiscence, a community interface, garage

machine, and different Input/Output gadgets inclusive of, for example, a mouse and keyboard. In a few embodiments, the hardware resources of the fifth layer may be allotted across more than one statistics centers in numerous geographical places.

FIG. 1 and Fig 2 is a block diagram example of a workflow within the the front-quit first layer with reference to the rest of the layers of the serverless cloud computing device , according with some embodiments of the existing specification. Referring to FIGS. A and B, the internet server gets a person request at step , from a consumer-facet viewing software (and/or from the caching and syncing application), which triggers a method, feature or operation to load scientific records such as a scientific image, collection or examine. At step , the net server first tests to look if the scientific facts asked is already loaded in the web server cache and if the records is similar to the only inside the storage (this is, the web server verifies that the data cached is consistent with the content material of the storage). If no longer, then the web server generates a request to technique the clinical records.

As image statistics files are obtained within the DICOM keep manner the image processor ingests the files, tactics them (as an example, to re-orient or generate thumbnails) and transfers them to the layers, and of the serverless computing device for in addition processing, at step. At step, scientific statistics files after having been processed at layers, and are transferred to the server cache. Finally, at step , the files from the server cache are communicated again to the purchaser-facet viewing software for viewing and/or to the caching and syncing application , even though it need to be appreciated that, ideally the caching and syncing application simplest makes use of original DICOM documents and not the changed content. Server helps the patron-aspect viewing application the use of the net viewer module.

In numerous embodiments, the entity correctly breaks-down its processing features into units and has every unit completed in execution environments instantiated at the system . Cost reduction is completed because the entity is required to pay best for the sources, at the gadget , which might be actually used and no longer for idle servers. Also, the entity is freed up from patching and dealing with servers. Applications or capabilities handling non-public records

and healthcare data along with, as an instance, the clinical images need to comply with the Health Insurance Portability and Accountability Act (HIPAA) that increases the charges for the entity to hold its personal servers. With the usage of FaaS provisioned on the serverless cloud computing machine , the entity is not required to keep clinical pix on its own servers thereby lowering the HIPAA requirement liabilities by using leveraging the HIPAA compliance of a third birthday celebration operator/issuer of the gadget .

Referring back to FIG. , the one or greater computing gadgets and clinical imaging gadgets talk with the at least one server and the cloud systems , via the caching and syncing tool that implements the caching and syncing software . It need to be obvious to people of ordinary skill in the art that the caching, syncing and other functionalities of the device , being discussed beneath, are enabled via the caching and syncing software . As discussed earlier in the specification, that while FIG. Illustrates the at least one server as a separate and discrete server in statistics communique with the one or more cloud structures and , in alternate embodiments the as a minimum one server can be applied inside the one or extra cloud structures and .

In some embodiments, the caching and syncing device is a DICOM device which implements part of the DICOM widespread relative to image verbal exchange. In embodiments, the caching and syncing device uploads and stores DICOM documents in one or extra cloud systems and . Moreover, information from DICOM archive and report storage is federated with the aid of caching and syncing utility implanted at caching and syncing tool . The caching and syncing device also gives a DICOM protocol to its customers. Further, the caching and syncing application performs a pre-fetch characteristic so that you can ensure pix simply available to users on demand. The pre-fetch function is defined in U.S. Pat. No. ,, and is incorporated herein by using reference.

The caching and syncing utility is configured to routinely down load photos brought to cloud storages and by way of different gadgets. The caching and syncing utility is likewise configured to mechanically down load older pics of a patient for whom recent pictures had

been brought to cloud storages and by other devices and prior pix of the patient that have been received from local gadgets or imaging modalities. The older snap shots are typically termed as ‘priors’. In embodiments, the caching and syncing device operates at the Least Recently Used (LRU) principle, with a view to optimize usage of the confined quantity of garage available therein. Accordingly, the least currently used photographs or statistics is discarded first to unfastened up storage space in the caching and syncing device .

The caching and syncing device communicates with the DICOM archive the usage of the DICOM protocol. In some embodiments, a web extension of the DICOM protocol, known as DICOMWeb, is used to enable verbal exchange among the caching and syncing tool and the DICOM archive . DICOM archive in cloud platform offerings the caching and syncing tool via indexing the pictures which can be uploaded to archive , thereby enabling the caching and syncing tool to question all the clinical records pertaining a affected person, or information within a selected term, or statistics taken care of by using any other parameter that may be listed. For instance, DICOM archive continues in a database a listing of photos, for each image, an identifier linking the picture with a particular affected person and the date when every image changed into obtained. Therefore, whilst the caching and syncing device calls for the listing of pics for a patient, DICOM archive is able to offer that listing quick, by way of querying the database.

In a few embodiments, the caching and syncing utility speeds up photo delivery to devices by using retaining a list of the series or research it has in cache and determines what's available in external cloud structures , . The caching and syncing utility then can broadcast what's to be had (a unified list) to workstations at the LAN . In a few embodiments, the consumer-facet viewing applications established on gadgets also allow dashing up image transport, at devices , by keeping a list of the collection or studies it has in cache and figuring out what is to be had in outside cloud platforms , .

In a few embodiments, the caching and syncing software is configured to hold a) the maximum latest photographs (oldest pix are removed) and b) pix (even supposing vintage)

related to a patient who has recent pix. With appreciate to (b), the caching and syncing software is configured to routinely search for “priors”, particularly studies, series, or different pics that correspond to the same patient however were taken at an in advance date or pursuant to a extraordinary physician prescription, the moment it detects a patient call from one or greater tags of a DCOM picture.

In different embodiments, the customer-facet viewing packages is likewise configured to maintain a) the maximum recent images (oldest pics are removed) and b) images (even though antique) associated with a patient who has latest photographs. With recognize to (b), the consumer side viewing application is configured to routinely look for “priors”, particularly studies, collection, or other photographs that correspond to the equal affected person but were taken at an in advance date or pursuant to a one of a kind doctor prescription, the moment it detects a affected person name from one or more tags of a DCOM picture.

In a few embodiments, as mentioned above, server and services such as offerings and are applied inside and by way of the caching and syncing tool to enable sending and receiving photographs to and from DICOM gadgets and to add these pix to or down load images from the archive . In an example, an photo asked with the aid of the caching and syncing device can be requested with a exceptional compression or even a JPEG illustration of the photo, rather than as a conventional, uncompressed DICOM record. Such a conversion is supplied through the cloud platform for the records in DICOM archive and communicated to the caching and syncing tool .

Although embodiments have been described in language specific to structural features and/or methodological acts, it is to be understood that the disclosure is not necessarily limited to the specific features or acts described. Rather, the specific features and acts are disclosed as illustrative forms of implementing the embodiments. Conditional language, such as, among others, “can,” “could,” “might,” or “may,” unless specifically stated otherwise, or otherwise understood within the context as used, is generally intended to convey that certain embodiments could include, while other embodiments do not include, certain features, elements, and/or steps.

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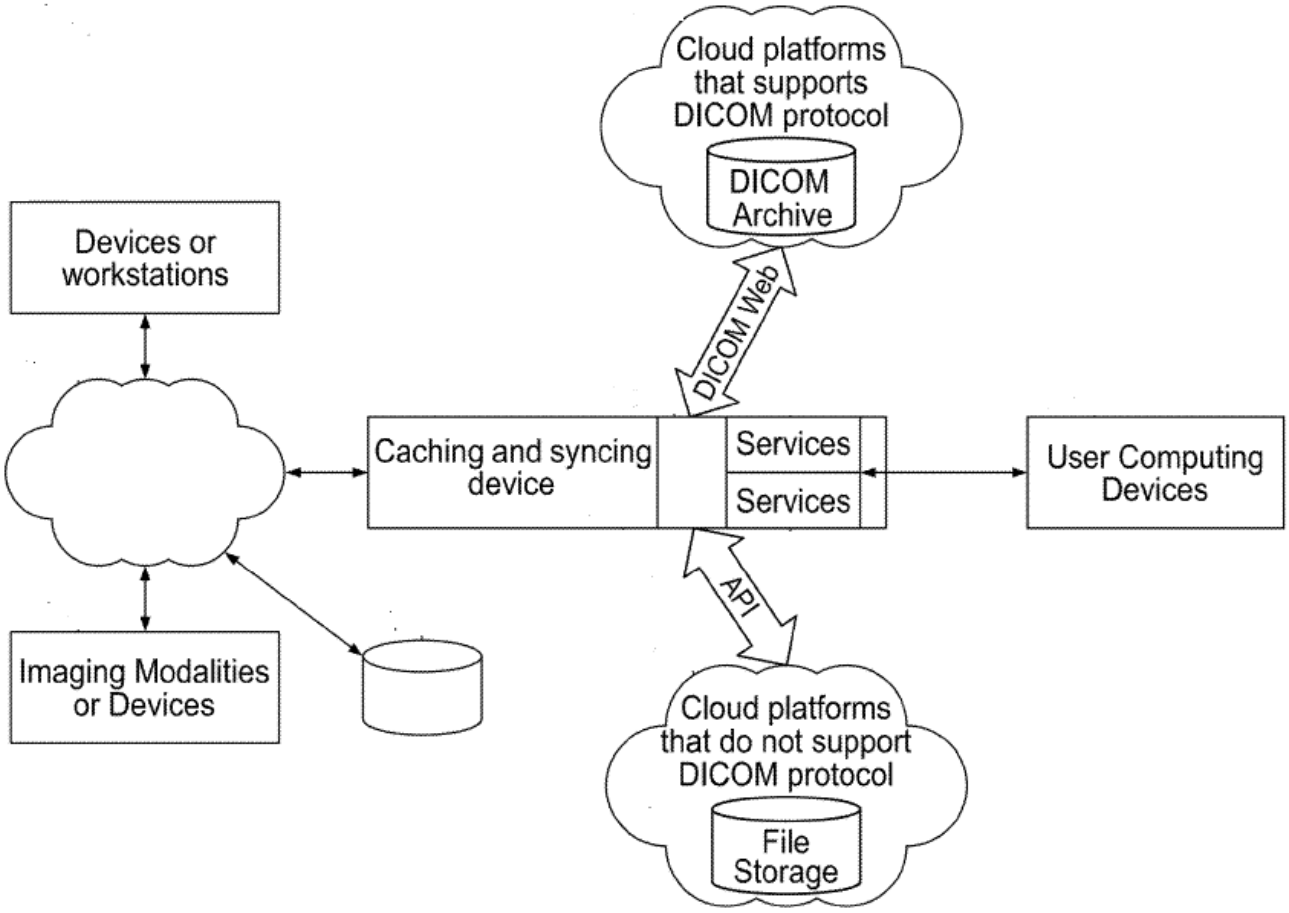

Figure 1

Dated this 25th May 2021.

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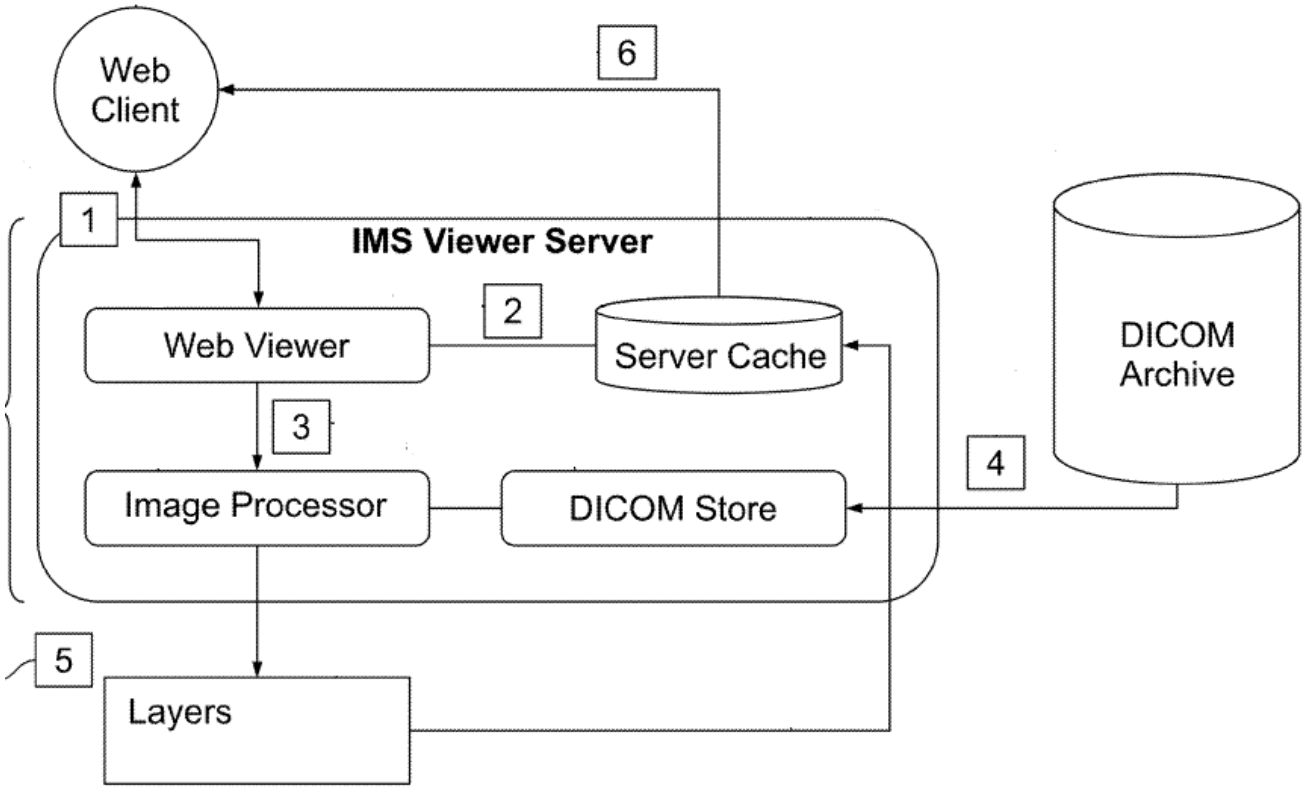

Figure 2

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CLAIMS,

We Claims,

[CLAIM 1] A smart system for medical image viewing by using artificial intelligence neural network comprising:

a) An photo viewing utility tailored to be done on one or more computing devices, in which the photograph viewing application is configured to:

i. generate a graphical consumer interface having a plurality of areas;

ii. receive the one or greater clinical photos, in which the one or extra scientific images incorporates unrendered imaging data;

iii. locally render, within the one or extra computing devices, the unrendered imaging information;

iv. display a rendered version of the unrendered imaging information in a first of the plurality of regions;

v. receive an evaluation of the one or extra clinical pictures, wherein the evaluation is generated from an application of a neural network to the only or extra clinical pictures; and

vi. display the evaluation in a 2d of the plurality of regions.

[CLAIM 2] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein Neural community is at least one in all a deep feed forward community, a perceptron community, a feed ahead community, a radial basis community, a recurrent neural community, a long time memory network, a brief time period memory community, a gated recurrent unit community, an auto encoder community, a variational automobile encoder community, a denoising vehicle encoder network, a

sparse car encoder community, a Markov chain community, a Hopfield community, a Boltzmann gadget network, a restrained Boltzmann system community, a deep belief network, a deep convolutional network, a deconvolutional network, a deep convolutional inverse images community, a generated hostile network, a liquid state system, an extreme studying system, an echo country community, a deep residual network, a Kohonen network, a aid vector device community, a neural Turing device community, or a convolutional neural network with switch studying community.

[CLAIM 3] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein first class of servers faraway from the one or greater computing devices, wherein the primary group of servers is configured to use the neural network to the one or extra medical pix and to transmit the evaluation to the only or extra computing gadgets.

[CLAIM 4] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein the function is at the least one in all an orientation detection feature, a body element detection function, a segmentation feature, a decimation function, a factor-snap feature, an area-snap characteristic, a contour-sculpting feature, a blur detection characteristic, or a propagation function.

[CLAIM 5] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein first class and group of servers is configured to shop the one or greater clinical imaging research, to transmit the only or greater medical imaging research to the only or greater computing gadgets, and to acquire, from the photograph viewing application, a request to use a feature to as a minimum one image within the first series of digital pix.

[CLAIM 6] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein the graphical consumer interface contains a first tab and a second tab, wherein the first tab contains the primary of the plurality of areas and wherein the second tab incorporates the second of the plurality of areas.

[CLAIM 7] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein the image viewing application is configured to robotically acquire and display the evaluation inside the second of the plurality of areas as per predetermined coverage and application as per identified.

[CLAIM 8] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein the one imaging modality of the first series is one in every of an X-ray scanning gadget, an ultrasound imaging system, a fluorescence-primarily based imaging device, a mammography gadget, a positron emission tomography system, a molecular imaging device, a MRI gadget, or a CT gadget, and in which every of the virtual pics in each of the first series is formatted in a DICOM format.

[CLAIM 9] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein first group of servers far away from the one or extra computing gadgets, in which the primary group of servers is configured to use the neural community to the primary collection of virtual images and to transmit the analysis to the only or more computing devices.

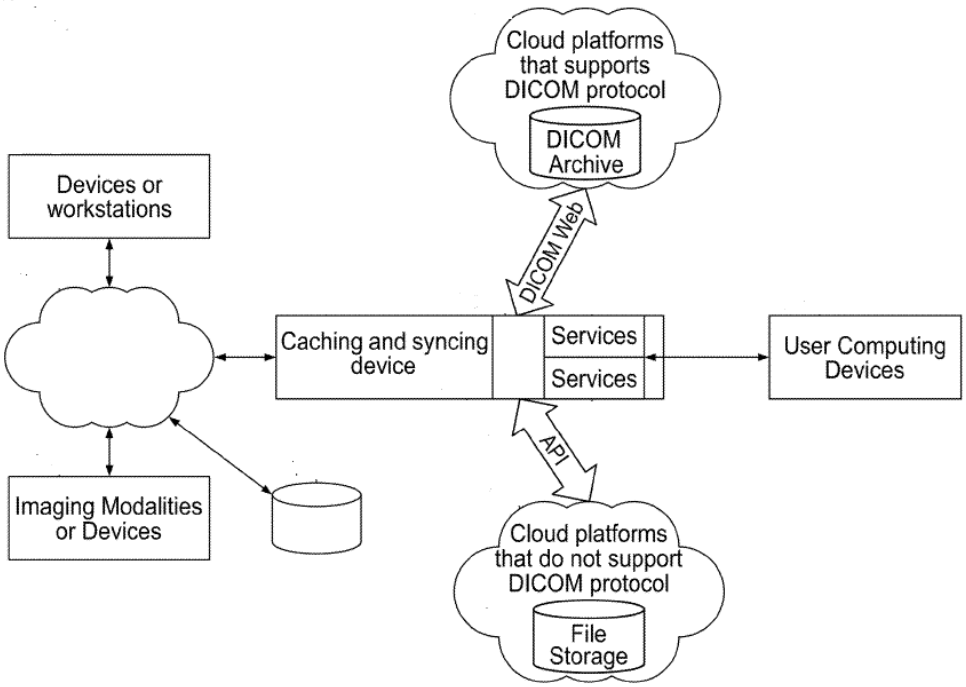
[CLAIM 10] The smart system for medical image viewing by using artificial intelligence neural network as claimed in claim 1 wherein the photograph viewing application is configured to obtain an commercial and show the commercial in a third of the plurality of regions of the connected cloud system and covered area by application.

Dated this 25th May 2021.

Signature 
Name: - Pratik Vora
Agent No:- IN/PA 3145

ABSTRACT

The smart system for medical image viewing by using artificial intelligence neural network comprising invention relates to generally to the field of medical data. More especially, the present specification is associated with systems and strategies for storing, processing, accessing and viewing medical photo records by means of presenting an stop-to-quit structure that allows the speedy synchronization of snap shots, efficient rendering of images on cellular gadgets, application of photograph processing functions in a cloud computing environment, education and application of neural community analyses on photographs, and upkeep and communique of kingdom statistics for modified photographs, among other functions. The structures also include a server tailored to be outside to the nearby vicinity community and in facts verbal exchange with the syncing application and a patron-facet viewing utility established on one or greater of the computing gadgets. The consumer-facet viewing software is configured to collect the research, including unrendered facts consultant data. [Figure 1]



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. APPLICANT(S)

a) **NAME:**	Rajeshwari R
b) **NATIONALITY**:	An INDIAN
c) **ADDRESS:**	Assistant Professor, Departmrnt Of Biomedical Engineering, Kpr Institute Of Engineering & Technology, Coimbatore-641407, Tamil Nadu, INDIA.
a) **NAME:**	Rajat Kapila
b) **NATIONALITY**:	
c) **ADDRESS:**	Assistant Professor, Department Of Electrical And Computer Engineering, Samara University, Samara, Ethiopia, AFRICA.
a) **NAME:**	Dr. Shubhajit Halder
b) **NATIONALITY**:	An INDIAN
c) **ADDRESS:**	Assistant Professor, Department Of Chemistry, Hislop College, Civil Lines, Nagpur, Maharashtra – 440001, India.
a) **NAME:**	Dr. Rachna Kohar
b) **NATIONALITY**:	An INDIAN
c) **ADDRESS:**	Assistant Professor, School Of Computer Science And Engineering, Lovely Professional University, Punjab – 144411, INDIA.
a) **NAME:**	Dr. S. Poongodi
b) **NATIONALITY**:	An INDIAN
c) **ADDRESS:**	D/O T. Subramanian, Professor / Ece, Cmr Engineering College, Kandlakoya(V), Medchal Road, Hyderabad, Telangana, India – 501401.
a) **NAME:**	Dr. S. Poongodi
b) **NATIONALITY**:	An INDIAN
c) **ADDRESS:**	D/O T. Subramanian, Professor / Ece, Cmr Engineering College, Kandlakoya(V), Medchal Road, Hyderabad, Telangana, India – 501401.
a) **NAME:**	Amit Kumar
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c) **ADDRESS:**	Associate Professor, Department Of Electronics,

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a) **NAME:** Chhaya Nayak
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c) **ADDRESS:** Assistant Professor, Department Of Computer Science, G H Raisoni College Of Engineering & Management, Pune, Maharashtra, India

a) **NAME:** Anandan.D
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a) **NAME:** Anuj Kumar
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a) **NAME:** JEMAL MOHAMMED AMIN
b) **NATIONALITY**: An INDIAN
c) **ADDRESS:** Lecturer, Department Of Electrical And Computer Engineering,132, Samara University, Samara, Afar Regional State, Ethiopia

2. NAME, ADDRESS AND NATIONALITY OF THE JOINT APPLICANT.

hereby declare :

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

OR

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

Name of Country	Date of Application	Application No	Status of Application	Date of Publication/ Publication No.	Date of Grant/ Grant No.
NA	NA	NA	NA	NA	NA

3. NAME AND ADDRESS OF THE ASSIGNEE

(iii) that the rights in the application(s) has/have been assigned to **NONE**.

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 25th May 2021.

4. To be signed by the ~~applicant~~ or authorized registered patent agent.

Signature
Name: - Pratik Vora
Agent No:- IN/PA 3145

To,
The Controller of Patents,
The Indian Patent Office,
At Mumbai/Delhi/Kolkata/Chennai

FORM 5

THE PATENTS ACT, 1970
(39 OF 1970)
&
THE PATENTS RULES, 2003
DECLARATION AS TO INVENTORSHIP
[See Section 10(6) and rule 13 (6)]

1. APPLICANT(S)

a) **NAME:** Rajeshwari R
b) **NATIONALITY**: An INDIAN
c) **ADDRESS:** Assistant Professor, Departmrnt Of Biomedical Engineering, Kpr Institute Of Engineering & Technology, Coimbatore-641407, Tamil Nadu, INDIA.

a) **NAME:** Rajat Kapila
b) **NATIONALITY**:
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a) **NAME:** Dr. Shubhajit Halder
b) **NATIONALITY**: An INDIAN
c) **ADDRESS:** Assistant Professor, Department Of Chemistry, Hislop College, Civil Lines, Nagpur, Maharashtra – 440001, India.

a) **NAME:** Dr. Rachna Kohar
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a) **NAME:** Dr. S. Poongodi
b) **NATIONALITY**: An INDIAN
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a) **NAME:** Amit Kumar
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a) **NAME:** Anandan.D
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a) **NAME:** Anuj Kumar
b) **NATIONALITY**: An INDIAN
c) **ADDRESS:** Assistant Professor, Department Of Management, I-25/2, Street No-10, Brahampuri, Delhi – 53, India.

a) **NAME:** JEMAL MOHAMMED AMIN
b) **NATIONALITY**: An INDIAN
c) **ADDRESS:** Lecturer, Department Of Electrical And Computer Engineering,132, Samara University, Samara, Afar Regional State, Ethiopia

hereby declare that the true and first inventor(s) of the invention disclosed in the complete specification filed in pursuance of our application number: ..... dated ……

2. INVENTOR(S)

d) **NAME:** Rajeshwari R
e) **NATIONALITY**: An INDIAN
f) **ADDRESS:** Assistant Professor, Departmrnt Of Biomedical Engineering, Kpr Institute Of Engineering & Technology, Coimbatore-641407, Tamil Nadu, INDIA.

d) **NAME:** Rajat Kapila
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d) **NAME:** Dr. Shubhajit Halder
e) **NATIONALITY**: An INDIAN
f) **ADDRESS:** Assistant Professor, Department Of Chemistry, Hislop College, Civil Lines, Nagpur, Maharashtra – 440001, India.

d) **NAME:** Dr. Rachna Kohar
e) **NATIONALITY**: An INDIAN
f) **ADDRESS:** Assistant Professor, School Of Computer Science And Engineering, Lovely Professional University, Punjab – 144411, INDIA.

d) **NAME:** Dr. S. Poongodi
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	No-10, Brahampuri, Delhi – 53, India.
a) **NAME:**	Anuj Kumar
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c) **ADDRESS:**	Assistant Professor, Department Of Management, I-25/2, Street No-10, Brahampuri, Delhi – 53, India.

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 this 25th May 2021.

Signature
Name: - Pratik Vora
Agent No:- IN/PA 3145

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

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

~~Dated this ……. day of ……..……, 20~~

To,
The Controller of Patents,
The Indian Patent Office, Mumbai / Delhi/ Kolkata/ Chennai

FORM 9

THE PATENTS ACT, 1970
(39 OF 1970)
&
PATENTS RULES, 2003

REQUEST FOR PUBLICATION
[Section 11 A (2); Rule 24-A]

We,

a) **NAME:** Rajeshwari R
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a) **NAME:** Rajat Kapila
b) **NATIONALITY**:
c) **ADDRESS:** Assistant Professor, Department Of Electrical And Computer Engineering, Samara University, Samara, Ethiopia, AFRICA.

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a) **NAME:** Dr. Rachna Kohar
b) **NATIONALITY**: An INDIAN
c) **ADDRESS:** Assistant Professor, School Of Computer Science And Engineering, Lovely Professional University, Punjab – 144411, INDIA.

a) **NAME:** Dr. S. Poongodi
b) **NATIONALITY**: An INDIAN
c) **ADDRESS:** D/O T. Subramanian, Professor / Ece, Cmr Engineering College, Kandlakoya(V), Medchal Road, Hyderabad, Telangana, India – 501401.

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a) **NAME:** JEMAL MOHAMMED AMIN
b) **NATIONALITY**: An INDIAN
c) **ADDRESS:** Lecturer, Department Of Electrical And Computer Engineering,132, Samara University, Samara, Afar Regional State, Ethiopia

hereby request for early publication of our application for Patent Application No**.** _____ dated _____ under section 11-A (2) of the Act.

Dated this 25th May 2021.

Signature

Name: - Pratik Vora

Agent No:- IN/PA 3145

To,
THE CONTROLLER OF PATENTS,
Office of the Controller General of Patents,
Baudhik Sampada Bhavan,
MUMBAI/KOLKATA/DELHI/CHEENAI