NEW MACHINE LEARNING METHOD FOR IMAGE BASED DIAGNOSIS OF COVID-19

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Abstract: **COVID-19 is a global epidemic as declared by the world health organization (WHO) IN March 2020, Techniques, Machinery and Training (ML) can play an important role in some areas. COVID-19 patients with a visual analysis of chest x-ray. In this article, a new MULTILEVEL method we propose to classify chest x-rays in the two sub-groups: patients with COVID-19 and non-COVID-19-person. In particular, an organic and chest X-ray with the new, the fraction of x-ray is carried out. Multichannel Exponential time (FrMEMs). In parallel, multicore computing the structures, which is used to speed up the design process. After editing, the Manta-Only Diet optimization based on differential evolution is used to select the most important features. It is proposed to the parliamentary method uses two sets of x-ray COVID-19 information. This is the method is achieved 96.09% accuracy, and 98.09% accuracy for the first and second data sets, respectively.**

1. Introduction

COVID-19 is a global problem that must be solved by scientific methods.Toanalyze the medical images is a well-known method that may be useful in the diagnosis of COVID-19.The severe acute respiratory syndrome (SARS), and COVID-19 belongs to theto the coronavirus family, in which several methods are used in order to detect cases of SARS, with the help of pictures[1-3], and in order to determine the events of the other [4]. Target has shown a high level of performance for a wide range of applications, view, analyze, and want toimages [5, 6], image classification [7], and image segmentation [8]. To classify the imagesthrough the import of selected images with the help of a description (e.g., SIFT [9], and thepicture the moment [10]), and these features can be used to classify the data with the help of these regulationsas SVM [11]. In difference from functions, the hand-made methods which are based on a deep neural network", [12], which provides high performance in the classification of images according to the extractedfeatures. According to the characteristics of the ML degree of effort, the use ofmachinery, equipment, education and training, in order to classify chest X-ray is a picture of the class of patients with COVID-19, in class, in the normal case. All of these experiments are based on a deep learning approaches. For example, the author of A CNN-based model is proposed for the auto-diagnosis of COVID-19, the use of more of the p-a chest pictures[13]. Their accuracy of correct classification is 96.78%, and with the help of the MobileNet architecture [13]. In the same way,the studies [14] the use of transfer learning. As you well know,thethe accuracy level of 97% and 87% accuracy for the InceptionV3, and 87% of the start-ResNetV2, respectively. Recently, the orthogonal moments and their variations have been a powerful tool which is used in many of theimage processing and pattern recognition applications. Apples to the actual use of the time photos -to successfully describe several applications [15] [16]. For example, you can combine the orthogonalwhile in the Arctic, the non-linear quaternion transformations, with real estate optimization algorithms, in order to present theand choose the features that have been successfully describe

the colors in the images classification [17]. The motivation behind this work is to provide an accurate method for classification of COVID19 My head in his chest is because of the combination of the strengths of the two approaches. First of all, a newFrMEMs the image descriptor. On the other, the better the lure of choice of methodology, which is based on feeding the manta rays The optimization and the Differential Evolution (MRFODE).In this paper, we propose a classification method, an x-ray image of the breast by COVID-19. The proposed method receives a character on the x-ray images of the breast using the FrMEMs moment. Followingthese features are divided into a test and a training package. If you are using thethe MRFODE algorithm is used to reduce those features, and to remove irrelevant features.This is the process of generating a number of solutions, and the design of the matching valueeach and every one of which is used for the KNN classifier training, which is based on the set of the determination of thethe very best of them. The MRFO operators, which can then be applied in the exploratory phase of the project, but during the operational phasethe probability that each solution is calculated with the aid of his expenses-defined goals. According to thethe criteria presented here, the solution is up to date and using either a filter or with the help of the MRFO players. The processin order to update the state's decisions in the terminal, the terms and conditions have been met. The best solution will be to use theto remove the irrelevant features as the test set and calculate the COVID-tags, 19a set of image data. \

The main contributions of this research is:

1. The proposed classification method of COVID-19 will depend on the properties of the orthogonalnow it has, and the feature selection methods.
2. Get the new FrMEMs management of the kit, in order to infer the signs of COVID-19Photo by.
3. Development of a new method for selecting features based on that, to improve the behavior of this indicator.Power optimization (MRFO), with the help of a differential equation (DE).
4. The commandments of the effectiveness of the proposed models, two sets of x-ray COVID-19 information.
5. The results of the comparison with other methods, the feature selection and the DNN based methods.

The organization of this work are as follows. In section 2, was used in the model FrMEMs, and the cinema of azerbaijanilham optimization algorithm is presented. Experimental results

The proposed models are discussed in section 3.

2. The proposed classification method is based on Image

Image moments and how to determine the projection of the function of a photo of a polynomial basis, in which the moments areif the photo is based on the use of global and local features, which of these images represents the time [18]. Usually,theprojections of digital images, the use of orthogonal polynomials with fractional orders, which results in theorthogonal moments of the fractional-order can take up a lot of the coarse and of the fine featuresone of the most of the digital image inputs. For this paper, a new technique, which is orthogonal exponential moments of the fractions of the order. When such a type of is to use a high-precision 961-object, each and every one of them. Enter the COVID-19 out of the picture. The internal features of the this picture is of the following:

1. This is orthogonal moments and is capable of successfully representing digital imagesa great style.
2. Orthogonal moments, which are invariant to geometric transformations,what is an attribute for the classification and reporting of a program that is not a problem.
3. Orthogonal to the moments of the continuous noise.
4. A fast and low-cost design, and requirements in order to make them available for real-time applications.

2.1. Feature extraction

features that start at the initial set of measured data, and generates the derived values (features) intended to be informative and to-the unemployed, the simple, the later stages of the study as well as the pressure and, in some cases, as a result the best of the human interpretation.

Apple, the sign is associated with a decrease in the size of the.[1]

Once the algorithm, the input data is very large for this process, and it is assumed that they are not needed (for example, on the same footing-foot distance, or to change the images, represented as pixels), and they may be a reduction in the number of features (also referred to as the direction of the functions). To define the fundamental, the first object is called the object of choice.[2]. It is expected that the selected item (s) that will contain the relevant information in a post, so that the position can be carried out with the help of this shortened show, instead of the complete core tasks.

2.2. Parallel implementation

In the parallel implementation, this trend over the past few years, has been used in order to speed up the computationally intensivephotography, in particular to frames, which are of large size and the high level of the order of the day. Createa new parallel architectures enriches the process of achieving this goal. Qin et al. [26] proposed a parallela recurring method, in order to speed up the process of Zernike moments. In this context, the Dan and so on. [27] extended the experience of the Software, and to his colleagues. They're from a parallelthe design and methodology of the time and the image reconstruction is basedthe Zernike moments. Recently, Salah, and others. [28] proposed a parallel computational method for velocity.up the calculation process of the polar to non-linear changes in the whole of your order. In this direction, we have proposed a parallel implementation of the FrMEMs in New York city and processorsThe Processor architecture. This is a parallel application, it is impossible to cope with the increase in the number ofchest X-ray datasets. FrMEMs consists of(pmax+1)×(qmax+1), now a component. This is the calculation of the components, and they are independent. Each component has a specific speed,a unique combination of p-and q-values. For example, the deficit, and almost from the moment of the appearance of 536 of the individual components, for the time being. Photo by. 1 shows, in parallel, from the FrMEMs of the moment. The Multi-core The processor features four cores, each and every one of the main compute part of the component, which for the time being.

2.3. Feature selection

In this section, we present a modified Manta Ray, search engine optimization (MRFO), based on the The Differential evolution (DE) as a function of the choice of the method used. However, the source and the MRFO THEY are the first.

2.3.1. To optimize the feeding of these (MRFO). In general, MRFO apes

The behavior of the three streams, including: the cyclone feed, the Chain of animal feed, animal feed, and tumbling[29]. A detailed feeding conditions can be found in the following sub-sections. Feed. This MRFO the food chain is formed by means of a line, and thus it is "in general, the tail". Also, for each agent, and except for the first one, that was happening in the direction of thethe food and the agent in front of you, does it mean that it is the current agent x(t), I = 1,2..., N), repeat the (h) to be updated on the basis of the agent and the agent is in the past. This is the process that I2.3.3 or later. MRFO the analysis is based on the function of the selection of THE wall. In this section, is used to prepareFor a classification model, the x-ray image of COVID-19 and based on the extract of the selected FrMEMsand executing the latest version of the MRFO, based on THE known as the MRFODEwill be presented. The first method starts with both COVID-19 and Non-COVID-19-the input image, with the help of the FrMEMs. After that, MRFODE to create a set of agents, each and every one of them solves the FS, the data are a subset of the selected function. Followingthe calculated fitness value for each agent, displays the quality of the selectedthe character equivalent to the logical version of each agent. The best agent of theThe best of the fitness of an agent is determined, and the built-in MRFO configuration statements used in updatingprocess. When the terminal state is checked (if it is reached). Finally, they will continue to operate, update, and repeat the process. The key step of the COVID-19 prevention image classification has three steps, in detail, every step is covered separatelyalt.The first step is to introduce the x-ray pictures are taken after the FrMEMs to apply a function to the Dthese images,. Performed, the object is divided into two kinds of education, training, andcumulative tests, which account for 80% and 20%, respectively, of the total number of photos,. FeatThis the sigmoid function is

applied, as it provides better performance than the traditional A logical strategy. In accordance with the definition, which is modeled in equation (22). Important: binary solutions represent the features that should be chosen, and it is not to be taken awayaccording to the null value.

Algorithm 1. Proposed MRFODE feature selection method.

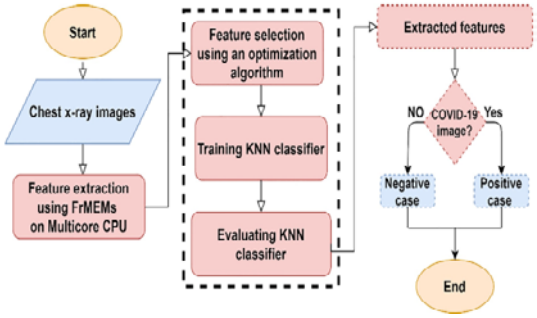
1. Input: Extracted features from COVID-19 x-ray images
2. Set the initial value for the parameters of MRFODE.
3. Split features into two training and testing sets
4. Generate a set of *N* agents (*X*).
5. Using Eq (23) to compute the fitness function of *x*based on thetraining set.
6. Find the best solution *x*
7. While (terminal condition not reached).
8. Using Eq (22) to convert each *x* to binary.
9. Using Eq (23) to compute the fitness function of each *x*
10. Find the best solution *x*
11. For *i*= 1:*N*
12. If *rand*<0.5*best*
13. If *t*/*T*<*rand*
14. Using Eq (14) to update *x*
15. Else
16. Using Eq (16) to update *x*
17. END IF **Cyclone foraging**
18. Else
19. Using Eq (11) to update *x*
20. END IF
21. END-FOR
22. For *i*= 1:*N*
23. Compute the probability using Eq (24)
24. If *Pr*<0.5
25. Update *x*using MRFO.
26. ELSE
27. Update *x*using DE.
28. END-FOR
29. *t*= *t*+1
30. End While
31. Reduce the testing set according to *x*, and using KNN to predictthe target.
32. Evaluate the quality of the model.

2.4. The proposed model summary

In order to classify chest X-ray imagescomplete all of the components of the model. Input Data for the classifier is a series of photos of the two ofcategories: COVID-19 and in the normal case. In parallel, the FrMEMs in New York city and processorsgetting the drawing of the features. Then, an optimization algorithm is used in order to make use of the objects. Finally,the most skilled and the selected KNN group.

3. The Experiment

Section 3.1. Data For this study, we used two different sets of data. The first set of data that have been collected by Joseph CohenPaul Morrison, and Lan Tao on GitHub [31], and photos of for 43 days. The links to each and every image contained in the metadata. The pictures are normal, and inflammation of the lungs, the virus wasthe database of chest X-ray images (pneumonia) [32]. It contains 216 Positive images of COVID-19 and a collection of the Twitter account of the Italian cardiothoracicradiologist), 1675, the negative images of COVID-19. The Data was collected from a retrospectivecohorts of pediatric patients, in the year, for five years, and the Women, and kidsGuangzhou Medical Center. We are saying that this is for a set of data is the data set-1. Another set of data that has been collected by a team of researchers from Qatar University, Doha,Qatar, and the University of Dhaka, Bangladesh, in conjunction with their counterparts in Pakistan.



and in Malaysia, in collaboration with a doctor-asadova, moody's opinion, the husband of [33]. Add it to the [31] and [32] forthere are more photos of the Italian Society of Medical and Interventional Radiology (SIRM) COVID-19 IS IN THE DATABASE [34]. This information consists of, 219 positive COVID-19 and photos1,341 negative COVID-19 in the pictures. We are saying that this is for a set of data in the data set, and (2). Both the collection of information, and had many features in common when it comes to the origin of the collection. The image data setsCOVID-19 were collected from the patients, aged 40 to 84 years

of age, for both men and women. This information includes the 216 to the positive COVID-19's photos, and 1,675 negative COVID-19 in the pictures.An example of such a picture, as well as the data, are shown in the image. 3.

3.2. Evaluation of the proposed model

The paper presents the results of the proposed classification method, an x-ray image of COVID-9in comparison with other popular methods, the name of the mentally disabled people, is being used as a FS. These methods include, among other things,contains a sine-cosine algorithm (SCA), Grey wolf optimizer (GWO), the Henry gas solubility optimization(HGSO), Keith is the optimization of the algorithm (given), and the Harris Hawks optimizer (HHO). These algorithms are used in the comparison, because the efficiency is determinedthe range of applications, such as global optimization methods and feature selection [35-39]. The quality of each of the FS algorithm is evaluated on the basis of three measures: the time, tothe features selected, and the values that are appropriate, in which the accuracy (Acc), is defined as:

$$Acc = \frac{T_P + T_N}{T_N + T_P + F_N + F_P} \times 100$$

Conclusion

In this paper, we propose a method for the visual detection of COVID-19 cases, the chest X-ray. In order to get the functionality of COVID-19, THE X-ray image of a fractional moments (i.e. FrMEMs used). It was an improved version of the Manta Ray Feeding Optimization(MRFO) to be used as a method to select the objects that have been modified by the APPLICATION, in order to improve the ability toMRFO to find a matching object, the export of the objects. In the proposed area of The method for selecting the MRFODE function KNN team, to make use of, regardless of whether it isthe x-ray image of the chest of COVID-19, and normal. A proposal of a method that has been evaluated in two differentdetails of the fixtures. The success of the CNN architecture, the MobileNet model is proposedthe method achieved a comparative measure of the accuracy of the analysis, and thethe accuracy of the estimates of the features. In the proposed method, both of which reachesthe high-performance, and the resource intensity of the choice of the most important features and functions.Our future will be able to run any other programs), medical, and other relevant areas.

References

[1]. Siddalingaih, Neelambike&Baraki, Parashuram. (2018). Cluster based authentication for VANET for improving the security. Compusoft. 7. 2556-2559. 10.6084/ijact.v7i2.699.

[2]. Siddalingaih, Neelambike& J, Chandrika. (2018). A DECENTRALIZED ADAPTIVE MEDIUM ACCESS CONTROL FOR V2I VANET. ICTACT Journal on Communication Technology. 9. 1696-1701. 10.21917/ijct.2018.0248.

[3]. Siddalingaih, Neelambike&Chandrika, J.. (2018). Anefficent distributed medium access control for V2I VANET. Indonesian Journal of Electrical Engineering and Computer Science. 9. 742-751. 10.11591/ijeecs.v9.i3.pp742-751.

[4]. Siddalingaih, Neelambike&Chandrika, J. (2017). AN EFFICIENT ENVIRONMENTAL channel modelling in 802.11p mac protocol for v2i. ICTACT journal on communication

[5]..Adebiyi, S.O., Oyatoye, E.O., Amole, B.B. (2016). Relevant Drivers for Customers` Churn and Retention Decision in the Nigerian Mobile Telecommunication Industry. Journal of Competitiveness, 8(3), pp. 52-67.

[6]. Hosseini M. S. and Zekri M., "Review of medical image classification using the adaptive neuro-fuzzyinference system," *Journal of medical signals and sensors*, vol. 2, p. 49, 2012. PMID: 23493054

[7]. Quek C., Irawan W., and Ng E., "A novel brain-inspired neural cognitive approach to SARS thermal image analysis," *Expert Systems with Applications*, vol. 37, pp. 3040–3054, 2010.

[8]. Xie X., Li X., Wan S., and Gong Y., "Mining x-ray images of SARS patients," in *Data Mining*, 2006, pp.282–294.

[9]. Rajpurkar P., Irvin J., Zhu K., Yang B., Mehta H., Duan T., et al., "Chexnet: Radiologist-level pneumoniadetection on chest x-rays with deep learning," *arXiv preprint ar X iv*:1711.05225, 2017.

[10]. Ke Q., Zhang J., Wei W., Polap D., Wozniak M., Kosmider L., et al., "A neuro-heuristic approach for rec-ognition of lung diseases from X-ray images," *Expert Systems with Applications*, vol. 126, pp. 218–232,2019.

[11]. Chouhan V., Singh S. K., Khamparia A., Gupta D., Tiwari P., Moreira C., et al., "A Novel Transfer Learn-ing-Based Approach for Pneumonia Detection in Chest X-ray Images," *Applied Sciences*, vol. 10, p.559, 2020.

[12]. Rawat W. and Wang Z., "Deep convolutional neural networks for image classification: A comprehensive review," *Neural computation*, vol. 29, pp. 2352–2449, 2017. https://doi.org/10.1162/NECO_a_00990PMID: 28599112

[13]. L. Yang, Y. Zhang, J. Chen, S. Zhang, and D. Z. Chen, "Suggestive annotation: A deep active learning framework for biomedical image segmentation," in *International conference on medical image computing and computer-assisted intervention*, 2017, pp. 399–407.

[14]. Y. Yang and S. Newsam, "Comparing SIFT descriptors and Gabor texture features for classification of remote sensed imagery," in *2008 15th IEEE international conference on image processing*, 2008, pp. 1852–1855.

[15]. Elaziz M. A., Hosny K. M., and Selim I., "Galaxies image classification using artificial bee colony based on orthogonal Gegenbauer moments," *Soft Computing*, vol. 23, pp. 9573–9583, 2019.