International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 8 Aug. 2022, pp: 1513-1516 www.ijaem.net ISSN: 2395-5252

Analysing Covid Result Using Artificial Intelligence

M. Lakshanadevi, Mrs.T.P Dayana Peter
Master of Computer science, Sri Muthukumaran institute of Technology, Chennai, India.
Assistant professor, Sri Muthukumaran institute of Technology, Chennai, India.

Submitted: 15-08-2022 Revised: 27-08-2022 Accepted: 30-08-2022

ABSTRACT
COVID-19 outbreak has put the whole world in an unprecedented difficult situation bringing life around the world to a frightening halt and claiming thousands of lives. Due to COVID-19's spread in 212 countries and territories and increasing numbers of infected cases and death tolls mounting to 5,212,172 and 334,915 (as of May 22 2020), it remains a real threat to the public health system. This paper renders a response to combat the virus through Articial Intelligence (AI). Some Deep Learning (DL) methods have been illustrated to reach this goal, including Generative Adversarial Networks (GANs), Extreme Learning Machine (ELM), and Long /Short Term Memory (LSTM). It delineates an integrated bioinformatics approach in which different aspects of information from a continuum of structured and unstructured data sources are put together to form the user-friendly platforms for physicians and researchers. The main advantage of these AI-based platforms is to accelerate the process of diagnosis and treatment of the COVID-19 disease. The most recent related publications and medical reports were investigated with the purpose of choosing inputs and targets of the network that could facilitate reaching a reliable Artificial Neural Network-based tool for challenges associated with COVID-19. Furthermore, there are some specific inputs for each platform, including various forms of the data, such as clinical data and medical imaging which can improve the performance of the introduced approaches toward the best responses in practical applications.

I. INTRODUCTION

A neuro-based approach to designing a Wilkinson power divider

M. Jamshidi, A. Lalbakhsh, S. Lot, H. Siahkamari, B. Mohamadzade, and J. Jalilian

In this paper, a new neuro- based approach using a feed- forward neural network is presented to design a Wilkinson power divider. The proposed power divider is composed of symmetrical modified T- shaped resonators, which are a replacement for quarter- wave transmission lines in the conventional structure. The proposed technique reduces the size of the power divider by 45% and suppresses unwanted bands up to the fifth harmonics. To verify the concept, a prototype of the power divider has been fabricated and tested, exhibiting good agreement between the predicted and measured results. The results show that the insertion loss and the isolation at the center frequency are about 3.3 ± 0.1 dB and 23 dB, respectively.

Clinical characteristics of novel coronavirus cases in tertiary hospitals in Hubei province

K. Liu, Y.-Y. Fang, Y. Deng, W. Liu, M.-F. Wang, J.-P. Ma, W. Xiao, Y.-N. Wang, M.-H. Zhong, C.-H. Li, G.-C. Li, and H.-G. Liu

Background: The 2019 novel coronavirus (2019-nCoV) causing an outbreak of pneumonia in Wuhan, Hubei province of China was isolated in January 2020. This study aims to investigate its epidemiologic history, and analyze the clinical characteristics, treatment regimens, and prognosis of patients infected with 2019-nCoV during this outbreak.

Methods: Clinical data from 137 2019-nCoV-infected patients admitted to the respiratory departments of nine tertiary hospitals in Hubei province from December 30, 2019 to January 24, 2020 were retrospectively collected, including general status, clinical manifestations, laboratory test results, imaging characteristics, and treatment regimens.

II. EXISTING SYSTEM

N. Zhu et. al., demonstrated infection caused by COVID-19 can damage human airway epithelial cells. It is also demonstrated that visualizing and detecting new human Coronavirus

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 8 Aug. 2022, pp: 1513-1516 www.ijaem.net ISSN: 2395-5252

can be done through using the effects of the human respiratory secretions on the human airway along with the results of transmission electron microscopy, and genome sequencing of culture supernatant also depicts the proposed neural network model and the Generative Adversarial Network (GAN).

To analyze electron microscopy images, feature extraction technique can be adopted. GANs are a special type of neural network model in which two networks are trained at the same time while one is focused on generating images, and the other performs discriminating.

GANs can solve these problems through effective modelling of the latent distribution of the training data. GANs have successfully been applied to image-to-image translation, segmentation and many other sub-fields of medical image computing.

DISADVANTAGES

- Although screening, diagnosis, and progress assessment of COVID-19 have been effectively performed through reliance on radiological examinations, including CT and digital photography (DR), there has been not much prior experience that could come to help radiologists and technologists to deal with COVID-19 patients.
- Although the cumbersome task of obtaining a large number of medical images for machine learning applications is possible, specialized and professional reading of diagnostic imaging report that could adroitly address context, syntax, structure, and specific terminologies needed to interpret the imaging is solely left with radiologists who could extract diagnostic information from images and make them available as structured labels for the use of the machine learning model training

III. PROPOSED SYSTEM

The main objective of the proposed structure is to improve the accuracy and speed of recognition and classification of the issues caused by the virus by utilizing DL-based methods.

We proposed an LSTM equipped model, which is the classification of the best treatment method. LSTM networks seem to be good options for classification, process, and prediction according to time series data because lags of unknown duration may take place between major events in a time series. Exploding and vanishing gradient problems that may appear in training traditional RNNs can be effectively dealt with by LSTMs which is proved to be a working tool in cases where sequences exist because in such cases the meaning of a word is dependent on the previous word.

ADVANTAGES

- Early screening of COVID-19 patients seems to be effectively managed through DL models demonstrated in this study that can be an effectively helpful supplementary diagnostic method for clinical doctors in close contact with patients.
- Although the proposed techniques have not been utilized yet to evaluate their effectiveness, there are many medical reports and valid sources of information proven the efficiency and accuracy of these methods in many different kinds of similar diseases. The most important result here is to generalize such strong methods based on the characteristics of COVID-19.

IV. ARCHITECTURE DIAGRAM

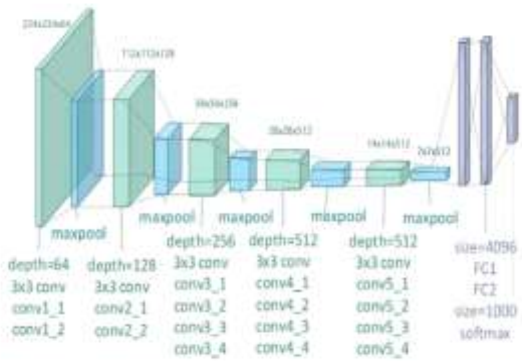

Fig – 1 Architecture Diagram

V. MODULE DESCRIPTION

MODULES:

- Dataset
- Importing the necessary libraries
- Retrieving the images
- Splitting the dataset
- Building the model
- Apply the model and plot the graphs for accuracy and loss
- Accuracy on test set
- Saving the Trained Model

Dataset:

In the first module, we developed the system to get the input dataset for the training and testing purpose.

Importing the necessary libraries:

We will be using Python language for this. First we will import the necessary libraries such as keras for building the main model, sklearn for splitting the training and test data, PIL for converting the images into array of numbers and other libraries such as pandas, numpy, matplotlib and TensorFlow.

Retrieving the images:

We will retrieve the images and their labels. Then resize the images to (224,224) as all images should have same size for recognition. Then convert the images into numpy array.

Splitting the dataset:

Split the dataset into train and test. 80% train data and 20% test data.

Building the model:

The concept of convolutional neural networks. They are very successful in image recognition. The key part to understand, which distinguishes CNN from traditional neural networks, is the **convolution** operation. Having an image at the input, CNN scans it many times to look for certain **features**. This scanning (convolution) can be set with 2 main parameters: stride and padding type. As we see on below picture, process of the first convolution gives us a set of new frames, shown here in the second column (layer). Each frame contains an information about one feature and its presence in scanned image. Resulting frame will have larger values in places where a feature is strongly visible and lower values where there are no or little such features. Afterwards, the process is repeated for each of obtained frames for a chosen number of times. In this project I chose a classic VGG-16 and V3 model which contains only two convolution layers.

The latter layer we are convolving, the more high-level features are being searched. It works similarly to human perception. To give an example, below is a very descriptive picture with features which are searched on different CNN layers. As you can see, the application of this model is face recognition. You may ask how the model knows which features to seek. If you construct the CNN from the beginning, searched features are random. Then, during training process, weights between neurons are being adjusted and slowly CNN starts to find such features which enable to meet predefined goal, i.e. to recognize successfully images from the training set.

Between described layers there are also **pooling** (sub-sampling) operations which reduce dimensions of resulted frames. Furthermore, after each convolution we apply a non-linear function (called **ReLU**) to the resulted frame to introduce non-linearity to the model.

Eventually, there are also fully connected layers at the end of the network. The last set of frames obtained from convolution operations is flattened to get a one-dimensional vector of neurons. From this point we put a standard, fully-connected neural network. At the very end, for classification problems, there is a softmax layer. It transforms results of the model to probabilities of a correct guess of each class

Apply the model and plot the graphs for accuracy and loss:

For X-ray,We will compile the model and apply it using fit function. The batch size will be 100. Then we will plot the graphs for accuracy and loss. We got average accuracy of 65.7% and average validation accuracy of 70.01%.

For CT-Scan, We will compile the model and apply it using fit function. The batch size will be 100. Then we will plot the graphs for accuracy and loss. We got average accuracy of 95.6% and average validation accuracy of 70.3%.

Accuracy on test set:

For X-ray, We got a accuracy of 74.01% on test set.

For CT-Scan, We got a accuracy of 74.2% on test set.

Saving the Trained Model:

Once you're confident enough to take your trained and tested model into the production-ready environment, the first step is to save it into a .h5 or . pkl file using a library like pickle.

Make sure you have pickle installed in your environment.

Next, let's import the module and dump the model into . h5 file

VI. RESULTS

Result will be positive or Negative.

Below is the sample result,

For X-ray, we got an accuracy of 74.01% on test set.

For CT-Scan, we got an accuracy of 74.2% on test set.

REFERENCES

[1]. C. Huang et al., ``Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China," THE LANCET, vol. 395, no. 10223, pp. 497506, 2020.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 8 Aug. 2022, pp: 1513-1516 www.ijaem.net ISSN: 2395-5252

[2]. N. Chen, M. Zhou, X. Dong, J. Qu, F. Gong,Y. Han,Y. Qiu, J.Wang,Y. Liu, Y. Wei, J. Xia, T. Yu, X. Zhang, and L. Zhang, ``Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study,'' Lancet, vol. 395, no. 10223, pp. 507513, Feb. 2020.

[3]. D. Wang, B. Hu, C. Hu, F. Zhu, X. Liu, J. Zhang, B. Wang, H. Xiang, Z. Cheng, Y. Xiong, and Y. Zhao, ``Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirusinfected pneumonia in Wuhan, China,'' Jama, vol. 323, no. 11, pp. 10611069, 2020.

[4]. K. Liu, Y.-Y. Fang, Y. Deng, W. Liu, M.-F. Wang, J.-P. Ma, W. Xiao, Y.-N. Wang, M.-H. Zhong, C.-H. Li, G.-C. Li, and H.-G. Liu, ``Clinical characteristics of novel coronavirus cases in tertiary hospitals in Hubei province,'' Chin. Med. J., vol. 133, no. 9, pp. 10251031, May 2020.

[5]. T. Guo et al., ``Cardiovascular implications of fatal outcomes of patients with coronavirus disease 2019 (COVID-19),'' JAMA Cardiol., early access, Mar. 27, 2020, doi: 10.1001/jamacardio.2020.1017.

[6]. P. Hamet and J. Tremblay, ``Articial intelligence in medicine,'' Metabolism, vol. 69, pp. S36S40, Apr. 2017.

[7]. M. Jamshidi, A. Lalbakhsh, S. Lot, H. Siahkamari, B. Mohamadzade, and J. Jalilian, ``A neuro-based approach to designing a Wilkinson power divider,'' Int. J. RF Microw. Comput.-Aided Eng., vol. 30, no. 3, Mar. 2020, Art. no. e22091.

[8]. M. Jamshidi, A. Lalbakhsh, B. Mohamadzade, H. Siahkamari, and S. M. H. Mousavi, ``A novel neural-based approach for design of microstrip lters,'' AEU-Int. J. Electron. Commun., vol. 110, Oct. 2019, Art. no. 152847.

[9]. M. B. Jamshidi, N. Alibeigi, A. Lalbakhsh, and S. Roshani, ``An ANFIS approach to modeling a small satellite power source of NASA,'' in Proc. IEEE 16th Int. Conf. Netw., Sens. Control (ICNSC), May 2019, pp. 459464.

[10]. Y. Mintz and R. Brodie, ``Introduction to articial intelligence in medicine,'' Minimally Invasive Therapy Allied Technol., vol. 28, no. 2, pp. 7381, 2019.

[11]. R. B. Parikh, Z. Obermeyer, and A. S. Navathe, ``Regulation of predictive analytics in medicine,'' Science, vol. 363, no. 6429, pp. 810812, Feb. 2019.

[12]. A. Becker, ``Articial intelligence in medicine: What is it doing for us today?'' Health Policy Technol., vol. 8, no. 2, pp. 198205, Jun. 2019.

[13]. N. J. Schork, ``Articial intelligence and personalized medicine,'' in Precision Medicine in Cancer Therapy. Cham, Switzerland: Springer, 2019, pp. 265283.