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COVID19- Data Tracker App using Deep Learning

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ABSTRACT

We describe how each of these applications vary with the availability of big data and how learning tasks are constructed. The purpose of this review is primarily to review the pathogen, Clinical features, diagnosis and treatment of Covid-19 but also to comment briefly on the epidemiology and pathology based on the current evidence. Deep Learning has additionally been utilized in Spread Forecasting for Epidemiology. Our literature review has found many examples of Deep Learning systems to fight COVID-19. 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. In this study, we analyse the incidence of COVID19 distribution across the world.

KEYWORD COVID-19, Deep Learning, SARS-CoV-2, Epidemiology, Diagnosis &NLP.

1.INTRODUCTION

The novel Coronavirus designated SARS-CoV-2 appeared in December 2019 to initiate a pandemic of respiratory illness known as COVID-19 which proved itself as a tricky illness that can emerge in various forms and levels of severity ranging from mild to severe with the risk of organ failure and death. From mild, self limiting respiratory tract illness to severe progressive pneumonia, multiorgan failure, and death. SARS-CoV-2 and the resulting COVID-19 disease is one of the biggest challenges of the 21st century. At the time of this publication, about 43 million people have tested positive and 1.2 million people have died as a result. Fighting this virus requires heroism of healthcare workers, social organization and technological solutions. This survey focuses on advancing technological solutions, with an emphasis on Deep Learning. We additionally highlight many cases where Deep Learning can facilitate social organization such as Spread Forecasting, Misinformation Detection, or Public Sentiment Analysis

. Deep Learning is advancing very quickly, but what is the current state of this technology?

What problems does Deep Learning have the capability of solving? Humans' contribution at this stage is important because their knowledge and potentials are not available to an ML solution that unlike humans is able to deal with huge data sets far beyond the extent that humans could handle or observe in a simultaneous manner. Moreover, Deep Learning (DL) methods could be employed in cases where enormous or complex data processing challenge ML or traditional means of data processing

2.COVID-19 DIAGNOSIS USING DEEP LEARNING Deep Learning to explain the relationship with other Artificial Intelligence technologies such as Machine Learning or Expert Systems. Deep learning algorithm enable computational models composed of multiple processing layers to learn data representation through several abstraction layer. They train a computer model to perform classification tasks directly from pictures, sounds and texts.

The next section lists and explains "Deep Learning applications for COVID-19". We organize surveyed applications by input data type, such as text or images. This is different from other surveys on COVID-19 that organize applications by scales such as molecular, clinical, and society-level. From a Deep Learning perspective, organizing applications by input data type will help readers understand common frameworks for research.

2.1Literature for COVID-19 The COVID-19 pandemic ignited a call to arms of scientists across the world. Consequentially, searching for signal in the noise is more challenging. The most popular open literature dataset, CORD-19, contains over 128,000 papers. These papers contain information about SARS-CoV-2, as well as related coronaviruses such as SARS and MERS, information about COVID-19, and relevant papers in relation to drug repurposing. No single or group of human beings could be expected to read this amount of text. The need to organize a massive scale of text data has inspired development of many NLP systems.

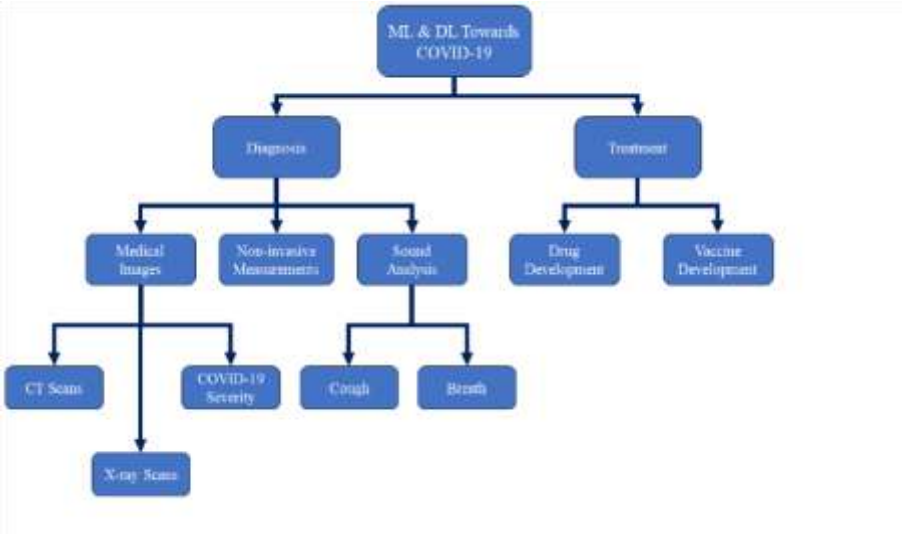
The authors state the twin goals of the dataset are "to evaluate search algorithms and systems for helping scientists, clinicians, policy makers, and others manage the existing and rapidly growing corpus of scientific literature related to COVID-19 and to discover methods that will assist with managing scientific information in future global biomedical crises".

2.2Natural Language Processing Deep Learning for "Natural Language Processing" (NLP) has been extremely successful. Applications for COVID-19 include Literature Mining, Misinformation Detection, and Public Sentiment Analysis. Searching through the biomedical literature has been extremely important for drug repurposing. Analysis free-text response surveys. For this reason, COVID-19 research has been much more focused on drug repurposing to find treatments. Another exciting application area is the intersection of Deep Learning and molecular engineering. NLP is also useful to evaluate public sentiment about the pandemic from data such as tweets and provide tools for social scientists. A success case of this is the repurposing of, an an drug used in rheumatoid arthritis. The potential Efficacy of this drug was discovered by querying biomedical knowledge graphs.

3.EPIDEMIOLOGY The biggest intervention to the spread of COVID-19 that has been implemented is sheltering-in-place. The solution of limiting contact between people significantly reduces the spread and prevalence of SARS-CoV-2. However, sheltering in-place comes at a massive economic and mental health cost. The field of Epidemiology aims to answer questions about the spread of infectious diseases such as COVID-19. The tools of Epidemiology, such as the SEIR differential equations, help us understand many important questions about the virus. How long will we need to remain quarantined in our homes? How much will quarantining slow down the spread of the virus? What do we know about the Infection rate? Answering these

questions is extremely important for allocating scarce resources such as ventilators, personal protective equipment, and ICU beds, as well as for public information. This section will explore how Deep Learning can improve spread forecasting.

3.1 Medical Inception using DL for Covid19 The Coronavirus (COVID19) outbreak is Increasing in the universal battle against COVID19 but it also Increase the accuracy and execution of the diagnosis.



3.2SIR Model We have just described adding additional structure to the population in forecasting models. Under the scope of black-box forecasting, we compared the differences between sequence modelling with a single region of numeric cases or deaths compared to combining information from multiple regions. Now we will turn our attention to one of the core models of epidemiology, the SIR model. This model provides additional prior knowledge about what we know about infectious disease spread and the population. SIR models are more specific in modelling subsets of the population for accurate forecasting.

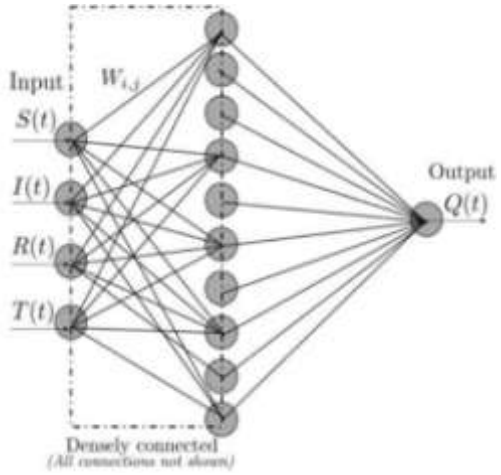
$$\frac{dS(t)}{dt} = -\frac{\beta S(t) I(t)}{N}$$

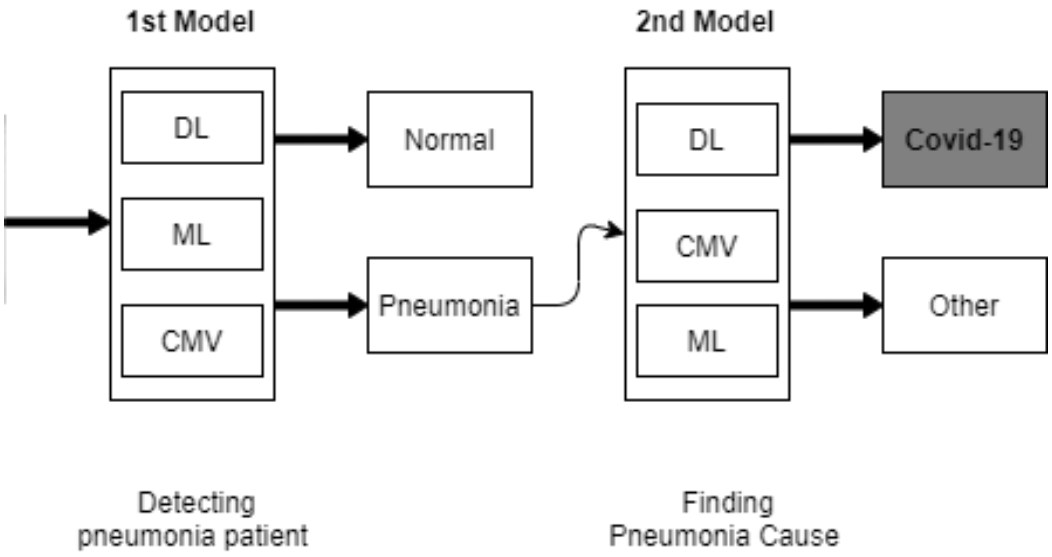
$$\frac{dE(t)}{dt} = \frac{\beta S(t) I(t)}{N} - \sigma E(t)$$

$$\frac{dI(t)}{dt} = \sigma E(t) - \gamma I(t)$$

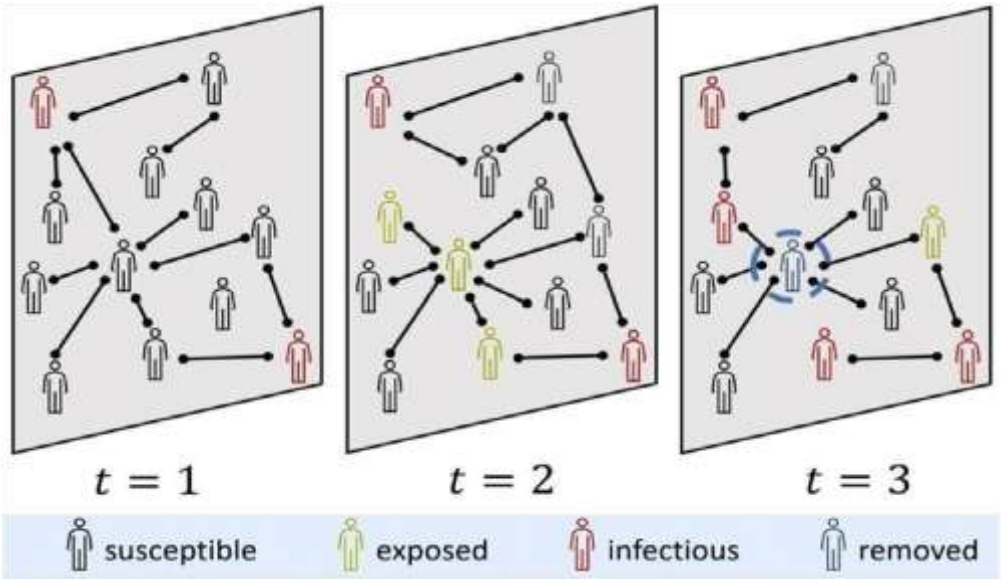
$$\frac{dR(t)}{dt} = \gamma I(t).$$

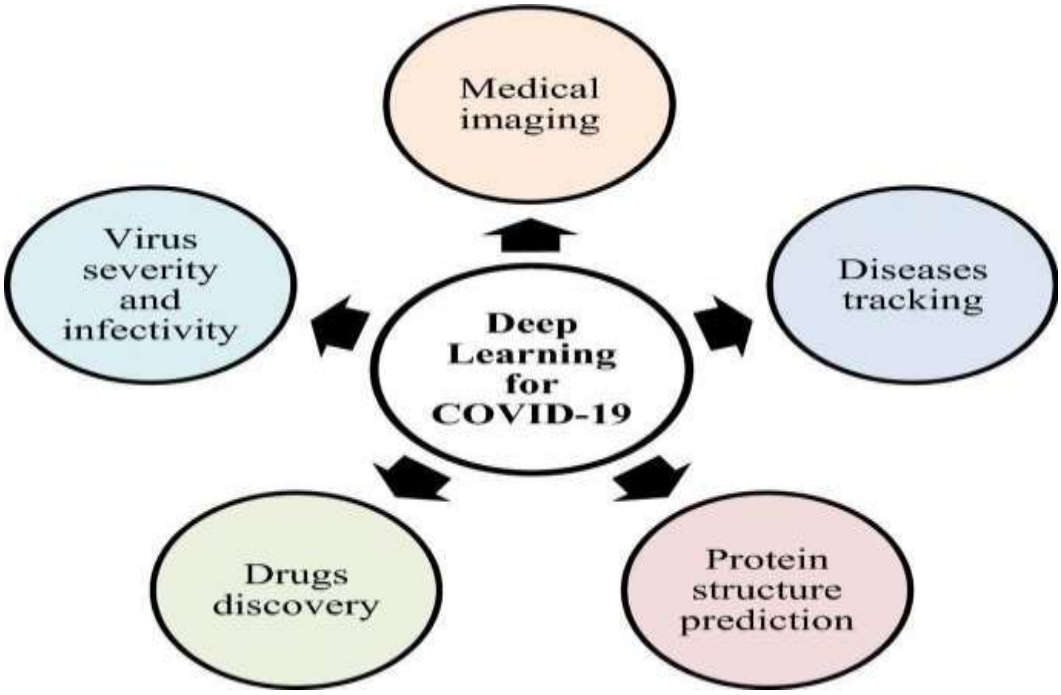
[H]





4.Deep Learning for Covid19 Earlier, we discussed the current state of Deep Learning and how it fits into the broader context of Artificial Intelligence. In this section, we detail where Deep Learning falls short and how this can be problematic for the COVID-19 applications explored. The limitations of Deep Learning described in this survey are framed in the context of Human-AI Interaction. It describes the absurdity of narrating. Deep Learning applications in healthcare without this context, "this pitting of clinicians versus a machine is the antithesis of clinical practice, which invariably keeps humans in the loop"



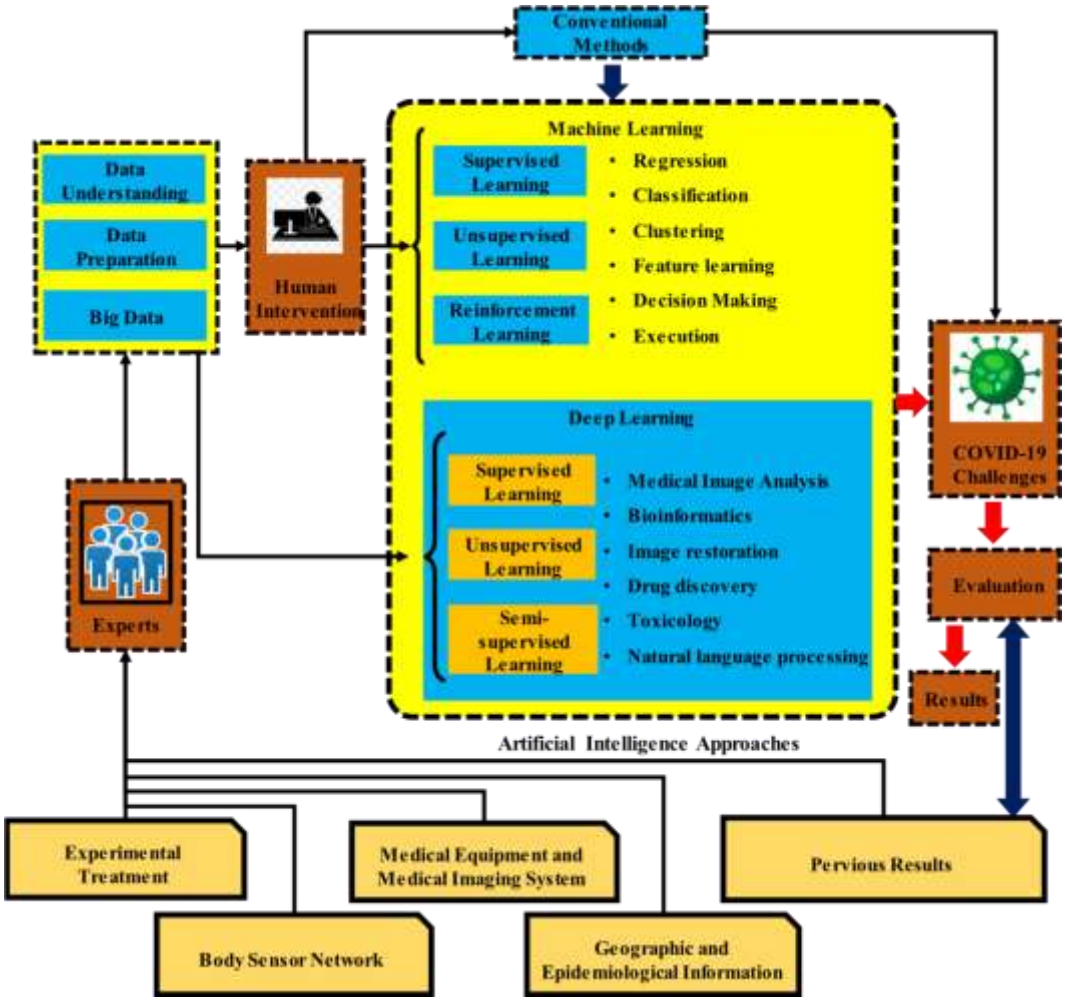


4.1Data Privacy This survey describes the use of Deep Learning to identify and remove patient identification information from free text information. An issue with constructing these datasets is privacy. Imagining the role of Deep Learning in precision, tailor-made medicine and diagnostics, we would expect performance to improve by looking a massive collection of patients' EHRs, genomes, blood testing results, family history, etc Humans' contribution at this stage is important because their knowledge and potentials are not available to an ML solution that unlike humans is able to deal with huge data sets far beyond the extent that humans could handle or observe in a simultaneous manner. Moreover, Deep Learning (DL) methods could be employed in cases where enormous or complex data processing challenge ML or traditional means of data processing.

4.2Discussion Discussion The integration of Deep Learning with Biology and Healthcare is an exciting DL Techniques in complex data estimation and prediction. ELM algorithm is suggested for predicting suitable drugs because it is highly advantageous in problem-solving, but the gradient -based learning algorithms like backpropagation are good to feedforward neural networks with more than one hidden layer. In the case of SLFNs, the present form of the ELM algorithm is valid. DL techniques in complex data estimation and prediction. ELM algorithm is suggested for predicting suitable drugs because it is highly advantageous in problem-solving, but the gradient-based learning algorithms like back-propagation are good to feedforward neural networks with more than one hidden layer. In the case of SLFNs, the present form of the ELM algorithm is valid. This survey highlights man -breaking applications to make this trend apparent.

Method	Description	Computing hardware	Transformed result
Differential privacy	Adds noise to the data; minimally affects population-level analysis	Edge computer	
Face blurring	Detects and blurs human faces	Sensor, edge computer	
Dimensionality reduction	Reduces the input size by reducing the number of features	Sensor, edge computer	
Body masking	Replaces peoplewith faceless avatars	Edge computer	
Federated learning	Edge devices learn locally, then sends gradient updates to central server	Edge computer, centralized server	
Homomorphic encryption	Enables predictions to be made from encrypted data	Edge computer, centralized server	

4.3The Possible Conventional Method Finding solutions for high-risk groups who face COVID-19 is the main concern of the present paper. Since reaching the best possible results is the main objective, we will try to demonstrate ways through which ANN-based methods could be used as complementary to the conventional ones. As [29] suggested it is necessary to keep patients involved COVID-19 registry that highlights clinical variables and cardiovascular complications because it facilitates the identification of the pattern of cardiovascular complications, furthers developing a risk model for cardiac complications, and assists with identification and/or prediction of the response to different types of treatment modalities. Another complication that COVID-19 causes in the elderly is heart failure, which requires heart failure specialists stay on guard and design a structured approach to this type of patient and include them in developing algorithms for the care of these patients in early stages until the time when definite universal COVID-19 examinations or clinical trials of antivirals are in place, and deeper understanding of final stages of the disease is realized .



5.CONCLUSION

In conclusion, we have presented many applications of Deep Learning to fight COVID19. we showed a mechanism for selecting the appropriate models of estimation and prediction of desired parameters using a number of clinical and non-clinical datasets. Succeeding in the combat against COVID-19 toward its eventual demise is highly dependent on building an arsenal of platforms, methods, approaches, and tools that converge to achieve the sought goals and realize saving more lives. he geographical issues, high-risk people, and recognizing and radiology were the main problems with COVID-19 and have been studied and discussed in this work. Also, we showed a mechanism for selecting the appropriate models of estimation and prediction of desired parameters using a number of clinical and non-clinical datasets.

6.ACKNOWLEDGEMENT I would like to express my special thanks of our group mentor Mr. Ranjeet Singh sir who gave me opportunity to do this project on COVID19- Data Tracker App using Deep Learning. And I would also like to thanks and acknowledge the HOD and the Staff of Information Technology Engineering department of Buddha Institute of Technology, for helping to construct this project.

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