Related Research

**Topic:** Research on Chest X-rays to deduct various respiratory infections

I referred some research papers on Chest X-rays (listed in the bottom of this paper) among those papers I discussing few important points and area of their research.

***PaperName: Dealing with Noise Problem in Machine Learning Data-sets: A Systematic Review by Shivani Guptaa,­, Atul Guptab***

In this paper they performed a systematic review on noise identification and handling studies published on various conferences and journals between January 1993 to July 2018. We have identified 79 primary studies are of noise identification and noise handling techniques. After investigating these studies, we found that among the noise identification schemes, the accuracy of identification of noisy instances by using ensemble-based techniques are better than other techniques. But regarding efficiency, usually single based techniques method is better it is more suitable for noisy data sets.

***PaperName: Semi-Supervised Learning of the Electronic Health Record for Phenotype Stratification by Brett K. Beaulieu-Jones***

This paper talks about the EHR data how and where the medical records were collecting and how denoising autoencoders perform dimentionality reduction enabling visualization and clustering for the discovery of the new subtypes of the disease.

***PaperName: A Parallel Patient Treatment Time Prediction Algorithm and Its Applications in Hospital Queuing-Recommendation in a Big Data Environment by KENLI LI***

They proposed a Patient Treatment Time Prediction (PTTP) algorithm to predict the waiting time for each treatment task for a patient. We use realistic patient data from various hospitals to obtain a patient treatment time model for each task.

***PaperName: Identification of Images of COVID‑19 from Chest X‑rays Using Deep Learning by Arjun Sarkar, Joerg Vandenhirtz, Jozsef Nagy, David Bacsa, Mitchell Riley***

In this study VisionPro Deep Learning is used to classify these Chest X-rays from the COVID dataset. The results are compared with the results of COVID-Net and various other state-of-the-art Deep Learning models from the open-source community. Segmenting the lungs in the first step, and then doing the classification step on the segmented lungs only, instead of using the entire image.

***PaperName: Identifying pneumonia in chest X-rays: A deep learning approach by Amit KumarJaiswal PrayagTiwari SachinKumar DeepakGupta AshishKhanna Joel J.P.C.Rodrigues***

In this paper, they describe about their deep learning based approach for the identification and localization of pneumonia in Chest X-rays (CXRs) images. Mask RCNN based model gives more accurate pixel wise semantic segmentation than faster RCNN for pneumonia prone regions in the lungs.

Algorithms: Mask RCNN and Fast RCNN

***PaperName: Customized VGG19 Architecture for Pneumonia Detection in Chest X-Rays by Nilanjan Dey , Yu-Dong Zhang , V. Rajinikanth, R. Pugalenthi , N. Sri Madhava Raja***

This paper develop a Deep-Learning System (DLS) to diagnose the lung abnormality using chest X-ray (radiograph) images.

(i) Conventional chest radiographs

(ii) Chest radiograph treated with a threshold filter. The initial experimental evaluation is carried out using the traditional DLS, such as AlexNet, VGG16, VGG19 and ResNet50 witha SoftMax classifier.

The results confirmed that, VGG19 provides better classification accuracy (86.97%) compared to other methods.

***PaperName: False negative chest X-Rays in patients affected by COVID-19 pneumonia and corresponding chest CT findings by M. Cellina , M. Orsi , T. Toluian , C. Valenti Pittino , G. Oliva***

This paper report 4 cases of false negative chest X-Rays, in patients who were diagnosed positive for COVID-19 by real-time transverse-transcript-polymerase chain reaction (RT-PCR), and executed chest unenhanced CTs just after the X-Rays, demonstrating signs of COVID-19 pneumonia.

***PaperName: Detecting Pneumonia in Chest X-Rays with Supervised Learning. By B. Antin, J. Kravitz and E. Martayan***

This paper took chest x-ray images from the NHIS dataset for the classification of images to pneumonia or not. The researcher leveraged a 121-layer Convolutional Neural Network similar to CheXNet for the classification purpose and it was observed that the deep learning model assumed an overall AUC of 0.684.

***PaperName: A new approach for classifying coronavirus COVID-19 based on its manifestation on chest X-rays using texture features and neural networks by SergioVarela-SantosPatriciaMelin***

In this paper authors tried to develop the system to auto detect the covid-19 positive cases such that they selected few different methods in each level and tested the dataset against the model.

Convolutional Neural Network with a classification accuracy of 83.02% and a superior AUC of 0.907, which would mean a better ability to detect the COVID19 using this method.

100% accuracy on the validation set using the feed-forward neural network, and this is using as inputs the flattened image and the texture features

Feature-based feed forward NN with an 84.02% classification accuracy and an AUC of 0.850.

**Remaining References:**

*[1] Deep representation learning of electronic health records to unlock patient stratification at scale by Isotta Landi*

*[2] Robust Speaker Recognition in Noisy Conditions by Ji Ming, Member, IEEE, Timothy J. Hazen, Member, IEEE, James R. Glass, Senior Member, IEEE, and Douglas A. Reynolds, Senior Member, IEEE*

*[3] Detecting Pneumonia in Chest X-Rays with Supervised Learning by Benjamin Antin, Joshua Kravitz, and Emil Martayan*

*[4] S.W Chiu, J.H Wang, K.H Chang, T.H Chang, C.M Wang, C.L Chang, C.T. Tang, C.F. Chen, C.H.Shih, H.W. Kuo and L.C. Wang, 2014. A fully integrated nose-on-a-chip for rapid diagnosis of ventilator- associated pneumonia. IEEE transactions on biomedical circuits and systems, 8(6), pp.765-778.*

*[5] U.R Abeyratne, V Swarnkar, R Triasih, and A Setyati, 2013, July. Cough Sound Analysis-A new tool for diagnosing Pneumonia. In 2013 35th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), pp. 5216-5219, IEEE.*

*[6] T. H. Pingale and H. T. Patil, 􀂳Analysis of Cough Sound for Pneumonia Detection Using Wavelet Transform and Statistical Parameters, 2017 International Conference on Computing, Communication,Control and Automation (ICCUBEA), Pune, 2017, pp. 1-6.*

*[7] World Health Organization (2020) Naming the coronavirus disease (covid-19) and the virus that causes it. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it*

*[8] World Health Organization (2020) The continuing 2019-ncov epidemic threat of novel coronaviruses to global health - the latest 2019 novel coronavirus outbreak in wuhan, China. https://pubmed.ncbi.nlm.nih.gov/31953166/*

*[9] World Health Organization (2020) Coronavirus disease (covid2019) situation reports.* [*https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports*](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports)*.*

*[10] Technology org, ai algorithm detects coronavirus infections in patients from ct scans with 96% accuracy. https://www.technology.org/2020/03/01/ai-algorithm-detects-coronavirus-infections-inpatients-from-ct-scans-with-96-accuracy, 2020(accessed March02, 2020)*

*[11] Paul CJ (2020) Covid-19 image data collection. https://github.com/ieee8023/covidchestxray-dataset*

*[12] Paul M (2020) Kaggle chest X-ray images (pneumonia) dataset. https://www.kaggle.com/paultimothymooney/chest-xray-pneumonia/*

*[13] Fang Y, Zhang H, Xie J, Lin M, Ying L, Pang P, Ji W (2020) Sensitivity of chest ct for covid-19: comparison to RT-PCR. Radiology.* [*https://doi.org/10.1148/radiol.2020200432*](https://doi.org/10.1148/radiol.2020200432)

*[14] J.P. Cohen, P. Morrison. and L. Dao. COVID-19 image data collection, arXiv:2003.11597, (2020).* [*https://github.com/ieee8023/covid-chestxray-dataset*](https://github.com/ieee8023/covid-chestxray-dataset)

*[15] J.K. Annavarapu (2015). Statistical Feature Selection for Image Texture Analysis. International ResearchJournal of Engineering and Technology (IRJET) Volume 2, Issue 5, pp. 546-550 (2015).John Hopkins University (2020). Coronavirus Research Center. Accessed on April 2020,https://coronavirus.jhu.edu/map.html*

*[16] S. Karthikeyan: “Performance Analysis of Gray Level Co-Occurrence Matrix Texture Features for Glaucoma Diagnosis”. American Journal of Applied Sciences Volume 11 Issue 2, pp. 248-257 (2014)*