Electrical Engineering and Systems Science > Image and Video Processing

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Predicting Pneumonia and Region Detection from X-Ray Images using Deep Neural Network

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Biomedical images are increasing drastically. Along the way, many machine learning algorithms have been proposed to predict and identify various kinds of diseases. One such disease is Pneumonia which is an infection caused by both bacteria and viruses through the inflammation of a person's lung air sacs. In this paper, an algorithm was proposed that receives x-ray images as input and verifies whether this patient is infected by Pneumonia as well as specific region of the lungs that the inflammation has occurred at. The algorithm is based on the transfer learning mechanism where pre-trained ResNet-50 (Convolutional Neural Network) was used followed by some custom layer for making the prediction. The model has achieved an accuracy of 90.6 percent which confirms that the model is effective and can be implemented for the detection of Pneumonia in patients. Furthermore, a class activation map is used for the detection of the infected region in the lungs. Also, PneuNet was developed so that users can access more easily and use the services.

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