# Extended Abstract Title Enhancing Pneumonia Images Using Intuitionistic Fuzzy Set

## ABSTRACT

Pneumonia is a respiratory disease of global concern that has gained further attention in the wake of the COVID-19 pandemic. This medical condition can lead to respiratory distress and inadequate oxygen intake. In specific clinical scenarios, medical professionals employ specialized diagnostic tools such as chest X-rays and computed tomography (CT) scans to gauge the extent of infection. However, medical images often inherent noise and suboptimal contrast. Therefore, contrast enhancement based on fuzzy technique is presented since it is able to handle vagueness efficiently. In this study, the intuitionistic fuzzy set (IFS) which is an advanced fuzzy set, is applied to improve the quality of radiographic imaging of pneumonia patients. The entropy-based approach is implemented to enhance the image contrast. Moreover, the IFS is compared with classical fuzzy set which is based on intensification operator. To perform comparisons and evaluate the quality of the output images, three metrics are employed: peak-signal-to-noise ratio (PSNR), mean square error (MSE), and structural similarity index measure (SSIM). Experimental results show that the intuitionistic fuzzy approach is more effective compared to the classical fuzzy methods based on visual and quantitative assessment.