

## I. INTRODUCTION

**P**NEUMONIA is a virus, bacterium, and fungi infection disease which causes alveoli swelling and gets worse easily if it is not taken care of immediately. There have been 922.000 infants deceased caused by Pneumonia in 2015 [1]. The main problem of this infection is its symptoms which are hard to identify. Recently, there is a checkup method using X-ray images which can be diagnosed by the doctors or even the experts. Nevertheless, the result needs to be improved because the misidentification of pneumonia can lead to death [2].

Extreme care when diagnosing Pneumonia is needed since the misdiagnose can increase the probability of death. Pneumonia diagnosed via X-ray images. There are some symptoms that are easy to recognize, for instance, the presence of white cloudy fogs inside the patient's lungs. The unclear lungs is one of the most recognized Pneumonia symptoms[4]. Identifying Pneumonia symptoms is too risky for the ones with no backgrounds of the disease and requires a long time for diagnosis. The classification system is needed to help early diagnosis of pneumonia.

The research for describing Pneumonia symptoms has been done in many classification methods and one of them using Self-Organizing Map (SOM). That method was able to get rid of unnecessary objects on the X-ray images and the result is 0.90 on accuracy [5]. There are also research to classify other lung diseases not just pneumonia, using Convolutional Neural Network, where its accuracy reaches 0.88 [6]. Then in 2019, the CNN method was applied to the pneumonia classification and showed the accuracy number on 0.87 [7]. Current performance can be increased by increasing the depth of CNN architectures such as using ResNet.

This research analyzes the Pneumonia classification using transfer learning method with ResNet architecture which the main purpose is to improve accuracy on previous research with the same dataset.