

**Abstract**

When it comes to the use of renewable resources, wind energy is one of the key indicators of buildings that use wind energy, such as wind turbines. In addition, wind speed is closely related to meteorological indicators and other natural phenomena. In other words, wind speed variables are one of the key factors in modeling natural phenomena. Based on the description above, Gaussian Mixture modeling was carried out on the distribution of wind speed in Padalarang, West Java. The test results are carried out by iterating Gaussian Mixture modeling on each Gaussian component up to twenty, from the modeling results, the Gaussian model with 4 components is chosen as the best Gaussian Mixture model obtained from the BIC score which is 33814.149 with the Gaussian model obtained is  $p(x) = (0.17)P(X|\theta) + (0.30)P(X|\theta) + (0.31)P(X|\theta) + (0.22)P(X|\theta)$ . In this case, the BIC assessment is obtained by observing the complexity of Gaussian's parameters and how much log-likelihood is obtained.

Keywords: EM Algorithm, log-likelihood, gaussian mixture model, probability density function, wind speed