

## **ABSTRACT**

*The interest of Indonesian in investment is still considered low. This can be seen in the number of people who did investment. The number of Indonesians who invested in capital market's stocks are just about 1.000.000 investors. this number is only 0.39 percent from Indonesian total population of 250 million. An investor expects for return in the future when investing their wealth. In every investment, there is always be risks. Risks are the uncertainty that will come along with return, risks can even mean a loss.*

*While investing in stocks, there are portfolios which consist of stocks combination that will be invested in by investors. To optimize portfolios, the single index model can be used. The implementation of this method can be used in big data by using genetic algorithm, which utilize return data and risks from future stocks value prediction ( $t+1$ ), which also formulated by data mining method by analyzing historical data from related stocks.*

*Data mining is a process of finding correlation, pattern, and new significance trend by separating a big amount of data which is stored in repository using patter recognition technology and statistics. one of data mining methods is artificial neural network which is popular recently because it provides high accuracy in prediction.*

*Keywords: Optimization, Prediction, Artificial Neural Network, Stocks Portfolio, Single Index Model, Genetic Algorithm*