ABSTRAK

Akbar Fajarianto Ramdan, 2024. *IMPLEMENTASI LEAST SQUARE-SUPPORT VECTOR MACHINE DENGAN OPTIMASI GREY WOLF OPTIMIZATION ALGORITHM DAN K-FOLD CROSS VALIDATION PADA PERAMALAN HARGA SAHAM PT TELEKOMUNIKASI INDONESIA TBK*. **SKRIPSI.** Gorontalo. Program Studi Statistika. Jurusan Matematika. Fakultas Matematika dan Ilmu Pengetahuan Alam. Universitas Negeri Gorontalo. Pembimbing : **(1) Salmun K. Nasib, S.Pd., M.Si, (2) Isran K. Hasan, S.Pd., M.Si**

Peramalan harga saham merupakan proses menganalisis data historis harga saham secara matematis dengan tujuan untuk memprediksi pergerakan harga saham di masa yang akan datang. Saham sendiri salah satu instrumen investasi yang sangat sensitif terhadap berbagai isu dan berita yang sedang terjadi sehingga cenderung memiliki sifat non-linear, fluktuatif, dan memiliki pola tren. *Least Square-Support Vector Machine* (LSSVM) merupakan salah satu metode peramalan dalam menangani masalah data yang bersifat non-linear terutama pada data harga saham. LSSVM bekerja menggunakan dua parameter penting (*hyperparameter*) yang akan mempengaruhi hasil peramalan yakni parameter regulasi (γ) dan kernel RBF (σ). Penentuan nilai optimal dari *hyperparameter* tersebut akan menggunakan bantuan algoritma optimasi *Grey Wolf Optimization* (GWO) dan *K-Fold Cross Validation* tanpa GWO. Hasil penelitian ini menunjukan bahwa penggunaan GWO dengan kombinasi *K-Fold Cross Validation* lebih baik dibandingkan *K-Fold* tanpa menggunakan GWO. Metrik evaluasi menunjukan nilai *Root Mean Squared Error* (RMSE) sebesar 47,0722. Nilai *Mean Absolute Percentage Error* (MAPE) sebesar 0,9002% dan nilai *Mean Absolute Error* (MAE) sebesar 35,4630. Artinya, penggunaan GWO sangat membantu dalam menentukan nilai optimal *hyperparameter* pada LSSVM dengan bantuan evaluasi model *K-Fold Cross Validation*.

Kata Kunci: *GWO, Harga Saham, K-Fold, LSSVM, Peramalan*

ABSTRACT

Akbar Fajarianto Ramdan, 2024. *IMPLEMENTATION OF LEAST SQUARE-SUPPORT VECTOR MACHINE WITH GREY WOLF OPTIMIZATION ALGORITHM AND K-FOLD CROSS VALIDATION FOR FORECASTING THE STOCK PRICE OF PT TELEKOMUNIKASI INDONESIA TBK.* **UNDERGRADUATE THESIS.** Gorontalo. Study Program of Statistics. Department of Mathematics. The Faculty of Mathematics and Natural Sciences. Universitas Negeri Gorontalo.
Supervisors : **(1) Salmun K. Nasib, S.Pd., M.Si, (2) Isran K. Hasan, S.Pd., M.Si**

Stock price forecasting is the process of analyzing historical stock price data mathematically with the aim of predicting future price movements. Stocks themselves are one of the investment instruments that are very sensitive to various issues and news that are happening so that they tend to have non-linear, volatile, and trend patterns. Least Square Support Vector Machine (LSSVM) is one of the effective forecasting methods in handling non-linear data problems, especially in stock price data. LSSVM works using two important parameters (hyperparameters) that will affect the forecasting results, namely the regulation parameter (γ) and the RBF kernel (σ). Determination of the optimal value of these hyperparameters will use the help of Grey Wolf Optimization (GWO) and K-Fold Cross Validation (K-Fold CV) optimization algorithms. The purpose of this research is to compare LSSVM forecasting results with the K-Fold Cross Validation optimization algorithm with GWO and K-Fold Cross Valdiation without GWO. The results of this study show that the use of GWO with a combination of K-Fold Cross Validation is better than K-Fold without using GWO. The evaluation metric shows the Root Mean Squared Error (RMSE) value of 47.0722. The Mean Absolute Percentage Error (MAPE) value is 0.9002% and the Mean Absolute Error (MAE) value is 35.4630. This means that the use of GWO is very helpful in determining the optimal value of hyperparametr on LSSVM with the help of K-Fold Cross Validation model evaluation.

Keywords: *Forecasting, GWO, K-Fold, LSSVM, Stock Price*