# USING STATISTICAL MODEL AND MACHINE LEARNING FOR GOLD PRICE PREDICTION

Abstract

This report presents a comparative analysis of three models, including Linear Regression, Gated Recurrent Unit (GRU), Autoregressive Integrated Moving Average (ARIMA), Long Short-Term Memory (LSTM) for predicting gold prices. The models are evaluated using MAE, MAPE, and RMSE metrics on historical gold price indicators data. The model with the lowest MAE, MAPE, and RMSE is recommended for gold price forecasting, contributing to improved understanding and accurate predictions in the gold market.

**Key words**: gold price, forecasting, linear regression, GRU, ARIMA, LSTM, ETS, random forest, BNN, GPR, and RNN

## I. INTRODUCTION

Our research focused on forecasting gold prices, a commodity known for its historical stability and use as a currency and reserve asset. By analyzing key influencing factors, we aimed to generate precise predictions and insights into price fluctuations and trends. To accomplish this, we applied nine predictive algorithms, including GRU, ARIMA, LSTM. Our findings identify the model with the highest accuracy in gold price prediction, offering valuable guidance to investors and the public for making well-informed decisions about gold investments and purchases.