**Bitcoin Price Prediction Using Machine Learning and Deep Learning Algorithms**

**1. Summarize of the Research**

**Objective**

In this paper, discuss and compare the performance of the different machine learning and deep learning models to predict the price of bitcoin. And the paper gave the Auto Regressive Integrated Moving Average (ARIMA) model, which is the best model for predicting the bitcoin prices among other models.

**Methodology**

In this case used various models to predict the prices of bitcoins.

* Regression models
* Linear Regression
* Ridge Regression
* Least Absolute Shrinkage Selector OperatorRegression (LASSO)
* Long-Short Term Memory (LSTM)
* Gated Recurrent Unit (GRU)
* Auto-Regressive Integrated Moving Average (ARIMA)

To do this Bitcoin price information was collected for four months during training to minimize computational efforts. And used different parameters to predict the price. Those are Close price, High price, Low price, Open price and Volume. Whole data set divided into 2 parts. First one is 80% for training the model and other 20% for testing. These models are evaluated using the Mean Absolute Error (MAE).

**Findings**

* ARIMA gave best result among other models with the lowest MAE value.
* The ARIMA-based model was the only model specifically designed for time-series data, unlike other models used.
* LASSO model gave the highest MAE value and that is the worst model among other models.

**Conclusions**

ARIMA model was the best model for predicting the prices of bitcoins among other models. And also its can handled the time series data effectively.

**Key contributions**

* Used to comparatively analyze machine learning and deep learning models to predict the prices of bitcoins.
* Highlights the importance of data quality and quantity in improving forecast accuracy.

**Limitations**

* Used limited date set. (Only last four months)
* Limited price varying factors, number of features in data set and data size.
* Used traditional algorithms over using new technologies.

**2. Identify Research gaps**

**Identified Research gaps**

* Used limited dataset to get the prediction of prices of bitcoins. And also used limited factors and features to get the relevant values regarding the predictions.
* Not used to modern technologies and algorithms forget the result and also not used hybrid models.

**Opportunities for further studies**

* Used larger data set to get the best results and used various factors, features to increase the accuracy level of the predictions.
* Explore new techniques and technologies, algorithms like Generalized AutoRegressive Conditional Heteroskedasticity (GARCH).
* Evaluating hybrid models that combine deep learning and statistical methods.