

Electricity Prices Prediction

Prophet:

- **Overview:**
 - Prophet is an open-source forecasting tool developed by Facebook. It is designed to handle time series data with strong seasonal patterns, holidays, and other special events.
- **Advantages:**
 - Prophet can capture seasonal patterns and handle missing data gracefully.
 - It provides intuitive parameters for controlling seasonality and holidays.
 - It's relatively easy to use and can be applied to various time series forecasting tasks.
- **Usage:**
 - You can use the Prophet library in Python or R to model electricity prices by providing historical price data along with timestamps and any relevant holidays or events.

Deep Learning Models:

- **Overview:**
 - Deep learning models, such as recurrent neural networks (RNNs) and long short-term memory networks (LSTMs), are capable of capturing complex patterns in time series data.
- **Advantages:**
 - Deep learning models can capture non-linear relationships and dependencies in the data.
 - They can automatically learn features and adapt to changing patterns over time.
 - Ensembling techniques like recurrent neural networks (RNNs) and convolutional neural networks (CNNs) can be used for even better performance.
- **Usage:**
 - Building and training deep learning models requires expertise in machine learning and neural networks. You would need to preprocess your data, design the architecture of the neural network, and fine-tune hyperparameters.

When working with advanced forecasting techniques like Prophet or deep learning models for electricity price prediction, consider the following steps:

- **Data Preprocessing:**
 - Clean and preprocess your historical electricity price data. Handle missing values, outliers, and any necessary feature engineering.

- **Feature Engineering:**
 - Extract relevant features, such as time of day, day of the week, and month, which can impact electricity prices. Also, consider incorporating external factors like weather data if they are relevant.
- **Model Selection:**
 - Choose between Prophet and deep learning models based on your dataset's characteristics and the complexity of the problem.
- **Hyperparameter Tuning:**
 - Tune the hyperparameters of your chosen forecasting model for optimal performance. This may involve grid search, random search, or more advanced techniques.
- **Training and Validation:**
 - Split your data into training and validation sets to evaluate the model's performance. Use metrics like Mean Absolute Error (MAE), Mean Squared Error (MSE), or Root Mean Squared Error (RMSE) to assess accuracy.
- **Testing:**
 - After training and validation, use your model to make predictions on a test dataset to assess its real-world performance.
- **Regular Updating:**
 - Electricity price patterns can change over time due to various factors. Periodically update your model with new data to ensure its accuracy.