WEEKLY REPORT-1

UniConverge Technologies is an automation company started in 2013 in Nodia, Uttar Pradesh. Kaushlendra Singh Sisodia is a founder and CEO of Uniconverge Technologies. Augmented Reality, Data Analytics, Internet of things, Machine Automation, Software development are services provided by Uniconverge Technologies. Mainly it is expertise in 'Wireless Communication' and 'Internet of Things'.

ROLE OF DATA SCIENCE AND MACHINE LEARNING IN UNICONVERGE TECHNOLOGIES:

Data Science and machine learning plays a key role in Smart learning, Smart healthcare, Data Aggregator and Monitoring System (DAMS).

- Data Science is used to extract the meaningful insights for humongous amounts of data. A data scientists will work with business stakeholders to understand what business needs. Once the problem has been defined, the data scientist may solve it using the data science process.
- It involves the collection of data, management of data, analysis and interpretation to present it visually.
- Data Science practitioners work with complex technologies such as Artificial Intelligence, Cloud Computing, Internet of things, Quantum Computing etc.
- Machine learning is an application of Artificial Intelligence that involves algorithms and data that automatically analyse and makes decisions by itself without human intervention.
- Machine learning uses the data and build models to give predictions.
- Therefore, Data Science and Machine learning are very crucial for businesses to make accurate decisions.

Forecasting of Smart City Traffic Patterns

OBJECTIVE:

The Objective of Smart City Traffic patterns is to enhance road safety, reduce traffic congestion and enhance emergency response. The machine learning model estimates future traffic flows based on historical data and current road conditions. And it gives the predictions to reduce Traffic and travel time and ensure safety to the people. There are some machine learning algorithms which are used for traffic prediction such as regression, time-series analysis.

LEARNING HIGHLIGHTS:

I learned basics of machine learning and some preprocessing techniques. And how Data Science is useful in machine learning.

PROBLEMS FACED:

While learning I have faced some problems regarding the subject. I couldn't understand some topics in machine learning.

Prepared By:

Yerramsetti Sai Vijaya Leela

Jiten Bhalavat

WEEKLY REPORT-2

Project Title: Forecasting of Smart City Traffic Patterns

- I learned about Bigdata and basics of Data Science. Bigdata refers to datasets that are too large and complex to be dealt with traditional data-preprocessing application software.
- Data Science plays a major role in Bigdata. Data Science or Data Analytics is a process of analyzing large datasets. Data Science is used to extract meaningful information from this large dataset.
- Some Python modules are used such as Pandas, Numpy and Matplotlib which makes data science easy and effective.
- The data doesn't contain any redundancies and missing values.so that we have to use some preprocessing techniques to clean the data.
- Data frames are a way of storing data in grids that are easily overviewed.
- To process Bigdata some frameworks are used such as Cassandra, Hadoop and Spark.
- Exploratory Data Analysis is used to filter the data from redundancies.

Firstly, I have to clean the Smart City dataset using preprocessing techniques. The dataset need to be consistent, there is no redundancy and missing values in a Smart City dataset.

Team Members:

In first weekly report, I forget to mention my team member. It is a team project with two members

- Yerramsetti Sai Vijaya Leela
- Bhalavat Jiten

Prepared By:

Yerramsetti Sai Vijaya Leela

Jiten Bhalavat

WEEKLY REPORT-3

Project Title: Smart City Traffic Patterns

Preprocessing is a crucial step in preparing a dataset for analysis. There are some preprocessing steps for smart city traffic pattern dataset.

- There are some missing values in a dataset. Due to this the data can be corrupted or failure to record the data.
- So we need to handle the missing values during the preprocessing of the dataset.
- If outliers are present, then it is important to remove outliers for analysis.
- We have to identify the relevant features for analysis.
- We have to select a model based on the dataset.

Probability and Statistics plays a major role in machine learning by providing the theoretical foundation and tools necessary to understand, model and analyze data.

- Probability theory enables us to model uncertainty and randomness in data. Machine learning algorithms often deals with noisy or incomplete data, and probability deals with predicting the likelihood of future events.
- Statistical methods help us make informed decisions based on data.

The data is divided into two parts:

- Train data
- Test data

Once the model is selected, then the model is trained with training data and it is evaluated with test data.

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WEEKLY REPORT-4

Project Title: Smart City Traffic Patterns

After Preprocessing the model is selected to train on this dataset. The model is selected based on the problem (classification, regression, clustering etc).

The data can be classified into 2 parts:

- Train data
- Test data

Train different models on the training data and evaluate their performance on the testing data using the chosen metric.

Adjust hyperparameters like learning rate, number of layers, regularization strength etc to find the optimal configuration for each model.

Select relevant features and potentially create new ones to improve model performance. Perform cross-validation to assess model stability and generalize performance.

Compare model performance and choose the one that performs the best on chosen metric.

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