Lgbm - Light Gradient Boosting Machine

Light Gradient Boosting Machine', is an open source, high-performance gradient boosting framework designed for **efficient and scalable machine learning tasks**. It is specially tailored for **speed and accuracy**, making it a popular choice for **both structured and unstructured data in diverse domains**.

Key characteristics of LightGBM

- Ability to **handle large datasets with millions of rows and columns**, support for parallel and distributed computing, and optimized gradient-boosting algorithms.
- Excellent **speed and low memory consumption**.
- **Histogram-based techniques and leaf-wise tree growth**.

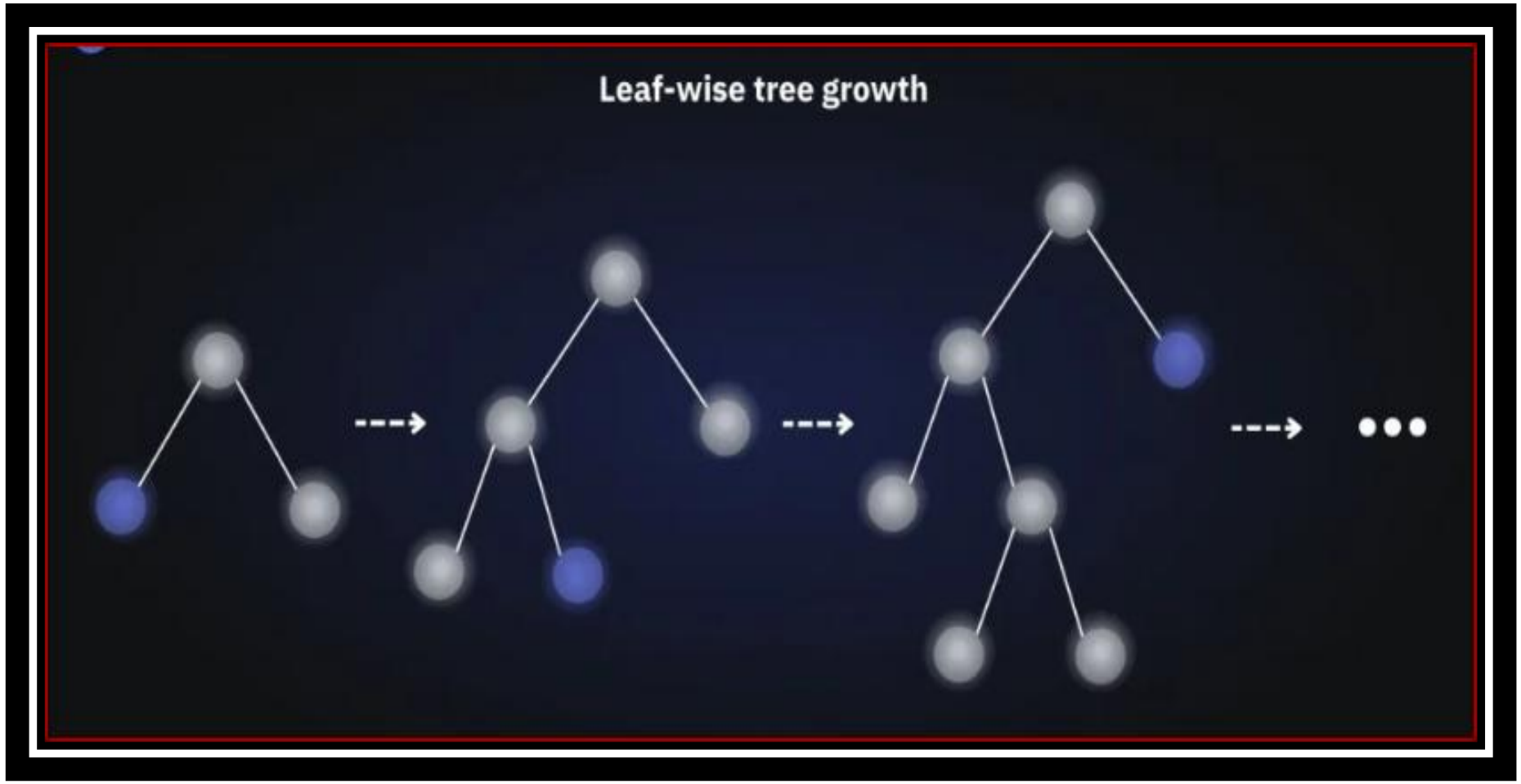
Difference between XGBoost and LightGBM

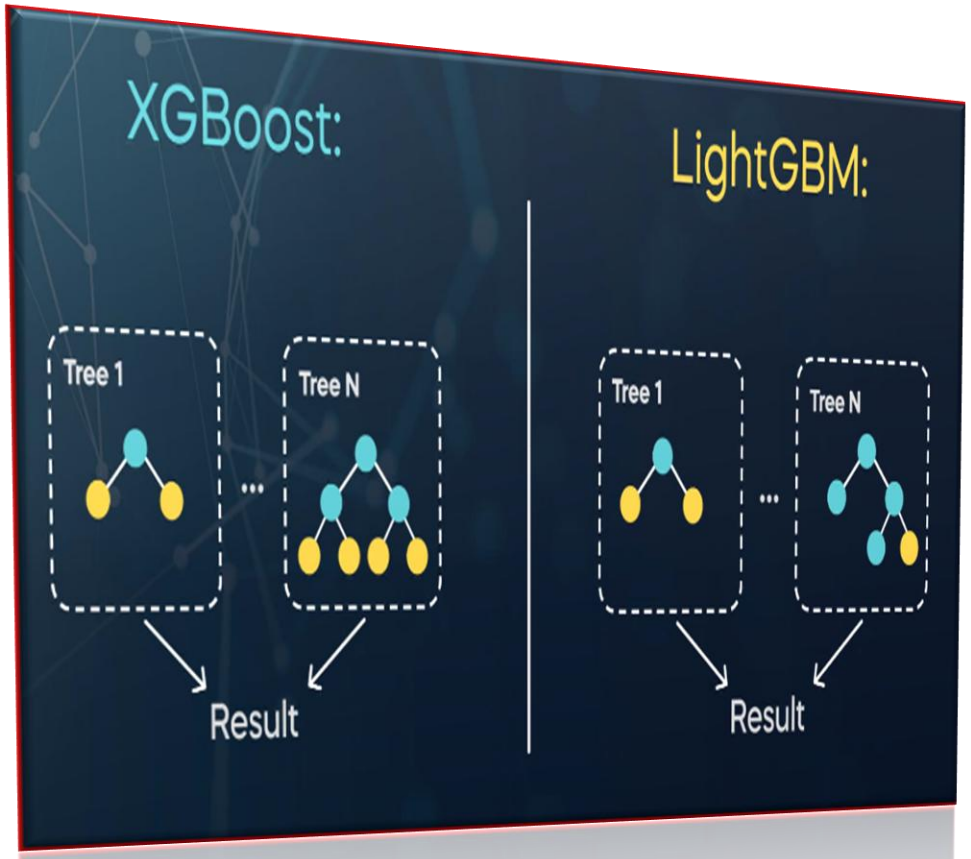
XGBoost

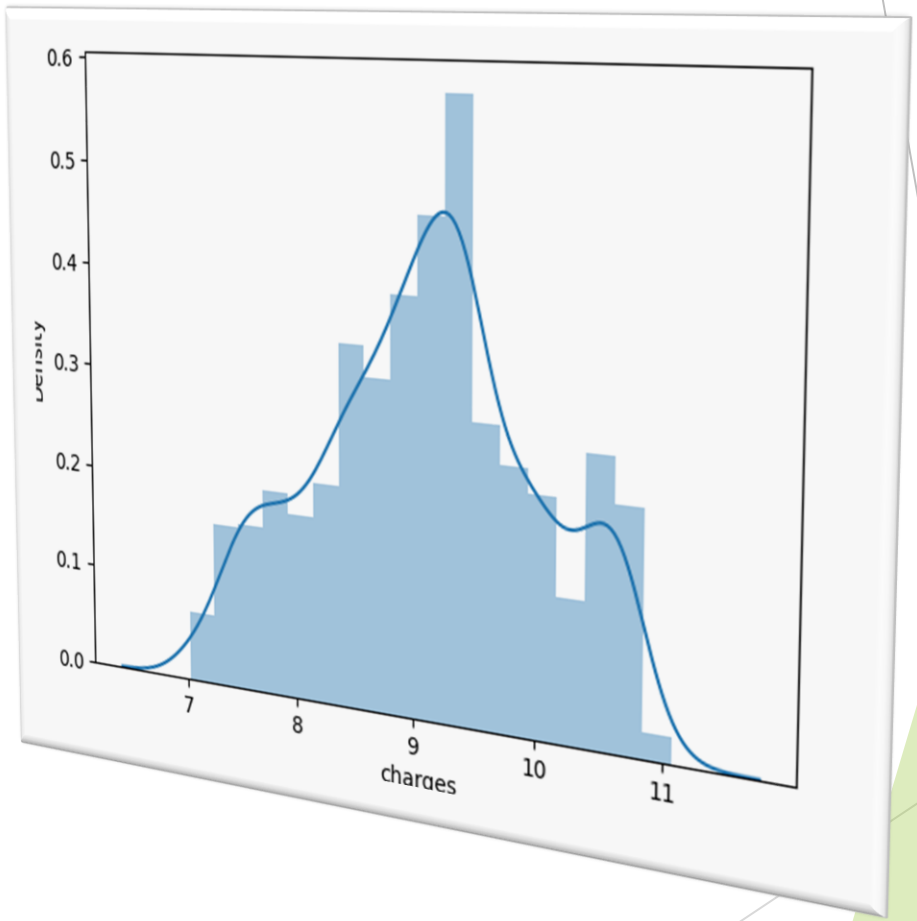
- LightGBM excels in speed and memory efficiency, especially on large datasets.
- A level-wise (depth-wise) tree growth strategy, it expands the tree layer by layer, which can lead to more pruning and regularization.
- Also scalable, but LightGBM is generally considered better for very large datasets.

LightGBM

- XGBoost is known for its robustness and regularization capabilities.
- Utilizes a leaf-wise growth strategy, where it grows the tree node by node. This approach often results in shallower trees compared to XGBoost.
- Designed for scalability and can handle large datasets efficiently.


Leaf-wise tree growth


XGBoost:
Tree 1
Tree N
Result
LightGBM:
Tree 1
Tree N
Result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