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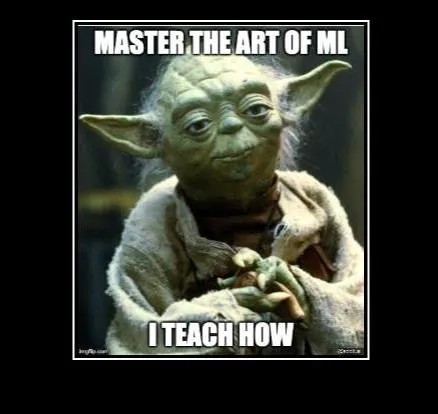


A simple overview on Machine Learning

[*Sayemuzzaman*](https://sayemuzzamansiam.medium.com/?source=post_page---byline--1e442376218b--------------------------------)



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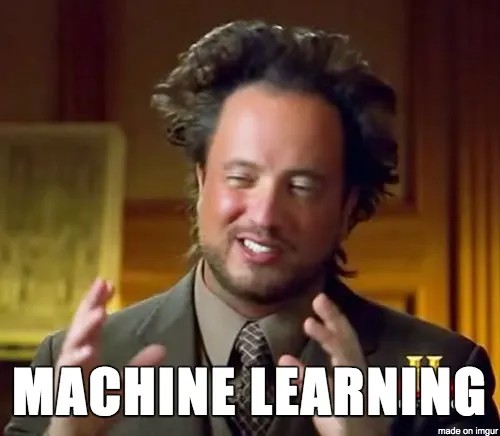


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At its core, machine learning (ML) is about teaching machines to learn from data and improve their performance over the time without being explicitly programmed. This is achieved through algorithms that identify patterns in data and use those patterns to make predictions or decisions.



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These are the fundamental building blocks that define how machine learning works:

1. *Data*
   1. : The raw material for machine learning.
   2. : Can be structured (e.g., tables) or unstructured (e.g., images, text).
   3. : Includes input data (features) and output data (labels/targets).
2. *Algorithms*
   1. : Mathematical procedures or rules that analyze data to identify patterns.
   2. : Examples: Linear Regression, Decision Trees, Neural Networks.
3. *Models*
   1. : The output of training an algorithm on data.

Represents the learned patterns and can be used to make predictions on new data.

1. *Evaluation*
   1. : The process of assessing how well a model performs.
   2. : Uses metrics like accuracy, precision, recall, or mean squared error..

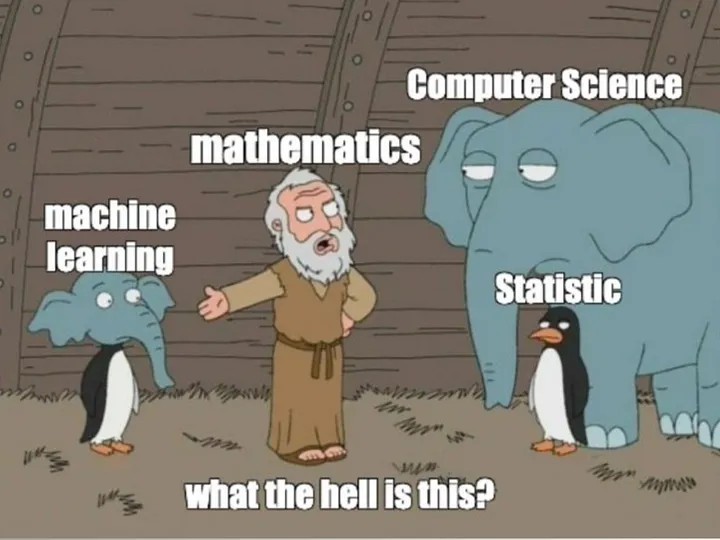
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These are the functional parts that make up the machine learning workflow:

1. *Datasets*
   1. : Collections of data used for training, testing, and validation.

Split into training data (to teach the model) and test data (to evaluate it).

1. *Features and Feature Engineering*
   1. : Features: The input variables used by the model to make predictions.
   2. : Feature Engineering: The process of selecting, transforming, or creating features to improve model performance.
2. *Model Training*
   1. : The process of feeding data into an algorithm to learn patterns. Involves adjusting model parameters to minimize errors.
3. *Evaluation Metrics*
   1. : Quantitative measures used to assess model performance. Examples: Accuracy, F1-score, ROC-AUC, Mean Absolute Error (MAE).



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1. Start with Data: Collect and prepare the dataset (e.g., clean, preprocess, split into training and testing sets).
2. Choose an Algorithm: Select an appropriate algorithm based on the problem (e.g., classification, regression).
3. Train the Model: Use the training data to teach the algorithm to recognize patterns.
4. Evaluate the Model: Test the model on unseen data to measure its performance using evaluation metrics.
5. Iterate and Improve: Refine the model by tuning hyperparameters, engineering better features, or using more data.

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*Machine Learning*

***├──*** Key Elements

*│ ├── Data*

*│ ├── Algorithms*

*│ ├── Models*

*│ └── Evaluation*

***└──*** Key Components

*├── Datasets*

*├── Features and Feature Engineering*

*├── Model Training*

*└── Evaluation Metrics*

**

***Not today, next time***

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