

Based on: *Mastering AI: A Step-by-Step Tutorial for Beginners*

Overview

- **AI Fundamentals & Concepts**
 - **Artificial Intelligence (AI):** The simulation of human intelligence processes by machines, especially computer systems.
 - **Machine Learning (ML):** A subset of AI that enables systems to learn from data without explicit programming.
 - **Deep Learning (DL):** A subset of ML that uses artificial neural networks with multiple layers to learn from data.
 - **Neural Networks:** Computing systems inspired by the biological neural networks that constitute animal brains.
 - **AI Applications:** Examples include image recognition, natural language processing, recommendation systems, and autonomous vehicles.
- **Model Development Workflow**
 - **Data Preprocessing:** Cleaning, transforming, and preparing raw data for AI model training.
 - **Missing Values:** Handling incomplete data points (e.g., imputation, removal).
 - **Outliers:** Identifying and addressing extreme data points that can skew results.
 - **Data Normalization/Scaling:** Adjusting the range of feature values to a common scale.
 - **Algorithm Selection:** Choosing the most suitable AI algorithm based on problem type and data.
 - **Model Training:** Feeding data to the algorithm to learn patterns and relationships.
- **Model Evaluation & Improvement**
 - **Accuracy:** The proportion of correct predictions made by the model.
 - **Precision:** The proportion of true positive predictions among all positive predictions.
 - **Recall:** The proportion of true positive predictions among all actual positive instances.
 - **Overfitting:** When a model learns the training data too well, performing poorly on unseen data.
 - **Underfitting:** When a model is too simple to capture the underlying patterns in the data.
 - **Bias:** Systematic error in a model's predictions, often stemming from biased training data.

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