

CS – Machine Learning

Overview

- Machine Learning Development Life Cycle

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- ❑ The Machine Learning Development Life Cycle (MLDLC) is a structured approach to developing and deploying machine learning models. It outlines the key stages involved in creating a machine learning solution from inception to deployment and maintenance.

MLDLC Steps

1. Problem Definition

- ☐ Identify the business problem or opportunity
- ☐ Define project goals and objectives
- ☐ Determine key performance indicators (KPIs)

MLDLC Steps

2. Data Collection

- ☐ Gather relevant data from various sources
- ☐ Ensure data quality and quantity
- ☐ Address data privacy and security concerns

MLDLC Steps

3. Data Preprocessing

- ☐ Clean and preprocess the data
- ☐ Handle missing values and outliers
- ☐ Perform feature engineering and selection

MLDLC Steps

4. Exploratory Data Analysis (EDA)

- ☐ Analyze data distributions and relationships
- ☐ Identify patterns and insights
- ☐ Visualize data to gain better understanding using graphs

MLDLC Steps

5. Feature Engineering

Feature engineering is the process of transforming raw data into meaningful features that improve the performance of machine learning models. It involves creating new features or modifying existing ones to enhance the model's ability to learn patterns and make accurate predictions.

MLDLC Steps

6. Model Selection

- ☐ Choose appropriate algorithms based on the problem type
- ☐ Consider model complexity and interpretability
- ☐ Evaluate potential models' strengths and weaknesses

MLDLC Steps

7. Model Training

- ☐ Split data into training and validation sets
- ☐ Train multiple models using different algorithms
- ☐ Tune hyperparameters to optimize performance

MLDLC Steps

8. Model Evaluation

- ☐ Assess model performance using appropriate metrics
- ☐ Validate models using cross-validation techniques
- ☐ Compare models and select the best performing one

MLDLC Steps

9. Model Deployment

- ☐ Prepare the model for production environment
- ☐ Integrate the model into existing systems or applications
- ☐ Ensure scalability and efficiency

MLDLC Steps

10. Monitoring and Maintenance

- ☐ Track model performance in real-world scenarios
- ☐ Retrain or update the model as needed
- ☐ Address issues such as concept drift or data shifts

MLDLC Steps

11. Documentation and Reporting

- ☐ Document the entire process, including decisions made
- ☐ Prepare reports for stakeholders
- ☐ Ensure reproducibility of results

Thank You