بسمه تعالی

دانشکده مهندسی کامپیوتر

طراحی سیستم‌های یادگیری ماشین

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علی زارع‌زاده

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1 Overview

Our goal in this document is to evaluate the project grades and raise the important values by reviewing the important metrics that matter to MLOps projects. Make your project reports and documentation to the point and Logically integrated, there is no additional bonus on long and fancy reports.

2 Second Phase Overview

In the last phase, you have developed the data preprocessing steps. Now you have high intuition and knowledge from different aspects of your data, and after the Data Cleaning part, your data is ready to use in the Model Deployment phase. In this phase, we go through selecting candidate models, training them, analyzing them, and choosing and deploying the best model for your project.

3 Data Model and Training

- Choose the right model candidates
  - After analyzing your problem definition and its complexity, the desired type of output from the model, and computational limitation; choose the right candidate models from all ML models.
  - Using ensemble learning solutions if needed.
- Set your Evaluation Metrics and Evaluation Procedures
  - Choose the right metrics due to your problem. Your problem has its special metrics that should be defined with the problem. Some examples:
    - For simple tasks: Accuracy, recall, precision, F1. choosing F1 hyperparameters with Trade-off between FP and FN.
    - For generative NLP tasks evaluation metrics such as bleu
    - Define the right metrics if your task is multi-label
  - Analyze your metric with the training procedure of your model and make sure your metrics and model training goal is consistent with each other
  - Set the right baseline for your evaluation
  - Check your model calibration if needed
- Training process

  - Create a manual simple Artifact and procedure for saving the results of your experiments with your chosen evaluation metrics
  - Train your candidate models and go through the right steps for your training procedure. e.x:
    * Solve your problem from simple to hard. Start with the simplest models and go through more complex models, try to overfit on a single batch, and go through the complete train dataset.
    * find the right hyperparameters for your model.

- Model Analysis
  - Model Confidence Analysis
  - Check model calibration
  - Analyze the feature importance of your final model to check everything is ok (e.x. There is no data leak in model features.) and enhance model interpretability.

- Evaluation
  - Make your offline evaluation report with the following data
    * your selected offline evaluation metrics
    * Saved metrics for each of your models on each training step with your selected artifact
  - If your project has computational limitations -it depends on your problem, your selected dataset, and your selected models- report them too.
  - In the end
    * choose your final model and explain why and in which trade-offs you choose your selected model.