Technical Report

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Training

Ranking

Reward

1. Introduction

This report details the technical steps taken to train machine learning models and compare decisions make with these models. The report is divided in three parts: training, validating, ranking decisions, computing reward. The steps we followed are depicted in Figure 1.

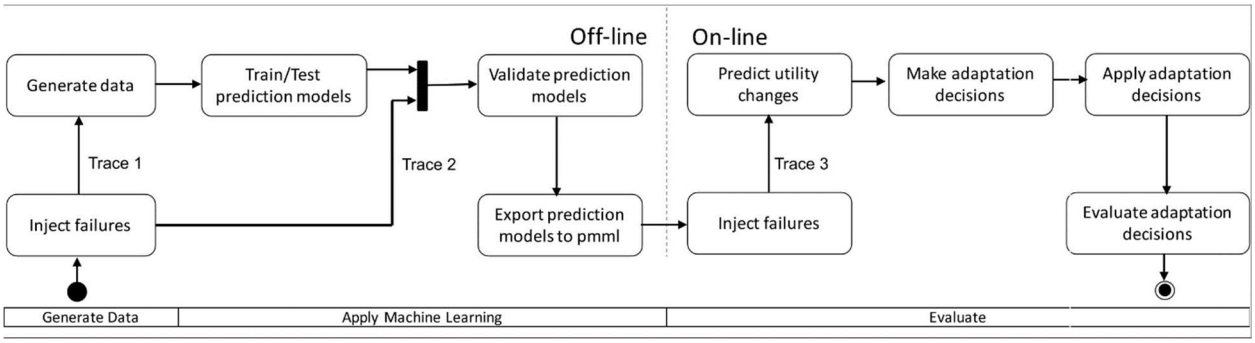

Figure 1 Methodology

The methodology that we followed divided between an off-line training process (performed in R) and an online execution of the trained models, which is performed in Java (utilizes an XML format exported by R). Both online and offline processes depend on injection of real failures. Below we explain each of these activities and provide data that was generated.

2. Inject Failures

We have two types of failure traces: sampled and full. The sampled failure traces consist of 5, 25, and 50 failures that are randomly injected to components. The full trace consists of multiple different set of failures.

3. Generate Data

4. Train and Test

The first step is to create Training comprises the machine learning models to predict utility functions

5. Validate Prediction Model
6. Export Prediction Model to pmml
7. Predict Utility Change
8. Make Adaption Decision
9. Apply Adaptation Decision
10. Evaluate Adaption Decisions

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