Patent Search

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Abstract:

Enhancing Just-in-Time Defect Prediction with Graph-Based Machine Learning and Artificial Intelligence is the proposed invention. The proposed invention focuses on understanding the pros and cons of just-in-time defect prediction systems. The invention focuses on analyzing the enhancement of Just-in-Time Defect Prediction using algorithms of Graph-Based Machine Learning.

Complete Specification

Description:[0001] Background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.
[0002] Machine learning (ML) is a branch of artificial intelligence (AI) that allows computers to learn from data and improve over time without being explicitly programmed. Machine learning (ML algorithms can detect patterns in data and learn from them to make predictions. These predictions can be generated through supervised learning, where algorithms learn patterns from existing data, or unsupervised learning, where they discover general patterns in data.
[0003] A number of different types of Just-in-Time defect prediction systems that are known in the prior art. For example, the following patents are provided for their supportive teachings and are all incorporated by reference.
[0004] Graph-based machine learning improves just-in-time defect prediction:- The increasing complexity of today's software requires the contribution of thousand developers. This complex collaboration structure makes developers more likely to introduce defect-prone changes that lead to software faults. Determining when the defect-prone changes are introduced has proven challenging, and using traditional machine learning (ML) methods to make these determinations seems to have reached a plateau. In this work, we build contribution graphs consisting of developers and source files to capture the nuanced complexity of changes required to build software leveraging these contribution graphs, our research shows the potential of using graph-based ML to improve Just-In-Time (JIT) defect prediction. We hypothesize that features extracted from the contribution graphs may be better predictors of defect-prone changes than intrinsic features derived from software characteristics. We corroborate our hypothesis using graph-based ML for classifying edges that represent defect-prone changes. This new framing of the JIT defect prediction problem remarkably better results. We test our approach on 14 open-source projects and show that our best model can predict whether or not a code change will lead to a

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