AIDOaRt

AI-augmented Automation for DevOps, a model-based framework for continuous development in Cyber-Physical Systems

Value Proposition

The growing complexity of CPS poses several challenges throughout all software development during their usage and maintenance. Many leading companies have started envisaging the automation of tomorrow to be brought about by full-blown Artificial Intelligence (AI) tech. While the number of companies that invest significant resources in software development is constantly increasing, the development and design techniques are still immature.

In this context, AIDOaRT is a large European collaborative project that aims at providing AI-augmented automation capabilities to better support the modeling, coding, testing, monitoring, and continuous development of CPSs. The project proposes to combine Model Driven Engineering principles and techniques with AI-enhanced methods and tools for engineering more trustable CPSs.

Scientific Objectives

The AiDOaRt projec expect an industrial uptake of AIDOaRt technologies on the development of complex systems that scales up to real systems demand with relevance for all critical applications.

AIDOaRt proposes enhancing the engineering process with AI-augmented methods (A IOps), integrating DevOps and Model-Driven Engineering (MDE) principles, and observing and analyzing collected data from both runtime and design time artifacts in rapid CSE cycles.

Proposed Solution

The AIDOaRt infrastructure will work with existing data sources, including traditional IT monitoring, log events, application, and more. The infrastructure is intended to work within the DevOps practices combining software development and information technology (IT) operations.

The project aims at using AIOps to automate decisions and process and complete system development tasks. AI technological innovations have to ensure that systems are designed responsibly contributes to our trust in their behavior, and requires both accountabilities, i.e. being able to explain and justify decisions, and explainability, i.e., internal mechanics can be trusted and easily understood by humans).

The overarching goal of AIDOaRt is to support requirements, monitoring, modeling, coding, and testing as part of a continuous system engineering (CSE) in Cyber-Physical Systems (CPS) and systems of Systems (CPSoS) via AI-augmented automation. AIDOaRt proposes enhancing the engineering process with AI-augmented methods (A IOps), integrating DevOps and Model-Driven Engineering (MDE) principles, and observing and analyzing collected data from both runtime and design time artifacts in rapid CSE cycles.

Expected Impact

Providing a model-based framework to support the CPS development process by introducing AI-augmented automation.

Enhancing the DevOps toolchain by employing AI and Machine Learning (ML) technique in multiple aspects of the system development process (such as modeling, coding, testing, and monitoring).

Supporting the monitoring of runtime data (such as logs, events, and metrics), software data, and traceability (Observe). Analyzing both data of historical and real-time data (Analyze) and the automation of functionality (Automate).

Use Cases

The project is currently composed of 31 partners (7 large enterprises, 12 small and medium-sized enterprises, 10 academic partners, and 3 research institutes).

10 partners are classified as Use Case Providers, while 23 are contributing as Solution Providers (some partners are both). Relevant application areas of the partners include Automotive, Aerospace, Railway, Maritime, Construction, Digital Life and Manufacturing. In AIDOaRt, various domain-independent DevOps phases are the focus of interest, namely AI-augmented Requirement Analysis, AI-augmented Modelling, AI-augmented Coding, AI-augmented Testing and AI-augmented Monitoring and each Use Case Provider participates in one or more of these DevOps phases.

Project coordinator : **Gunnar Widforss**

✉ gunnar.widforss@mdu.se

🐦 @aidoart   in @AIDoaRt   [QR code] WEBSITE