Master's Thesis

JOHANNES KEPLER UNIVERSITÄT LINZ

GUIDELINES FOR IEC 61499 DEVELOPMENT IN ECLIPSE 4DIAC IDE

LIT Cyber-Physical Systems Lab

Keywords: *Java, Eclipse 4diac IDE, SonarQube, Static Analysis*

Betreuung:

DI Dunja Životin
dunja.zivotin@jku.at

Current Situation

Due to the increasing popularity of PLC programming, more and more people are interested in IEC 61499. However, the backgrounds of these developers are very diverse, ranging from electrical and mechanical engineers to software engineers and even technicians. We propose implementing the first set of modularisation guidelines for IEC 61499, available here, to make the development and maintenance process of control software written in IEC 61499 easier.

Background

Eclipse 4diac IDE is an open-source, IEC 61499-compliant development environment designed to develop control software. Currently, there is no Sonar support targeted towards it. As developing control software falls under the umbrella of software engineering, we want to introduce best practices from the domain. They will have a positive impact and make the development of control software easier and more homogenous.

Content of the Thesis

The goal of this thesis is to integrate SonarQube or a Sonar product in Eclipse 4diac IDE and enable static analysis, cleaner code and bug detection for the domain of PLC programming. The first step is to integrate the existing guidelines and then, if time permits, find and integrate some that might arise during the process.

Requirements

- Programming experience in Java
- Willingness to learn something new about the domain of industrial automation
- Excellent English skills

Learning Outcomes

- Illustrate the challenges found in the domain of PLC programming w.r.t. clean code
- Define the rules which will be enforced by Sonar from existing guidelines (and possibly define new ones)
- Develop a way to enforce those rules
- Apply versioning systems in practice (Git)
- Ability to conduct scientific research