

Abstract

Model-Driven Development is based on the principle that the code can be automatically generated from software models that capture the high-level implementation of the system. This process of software development can save a lot of time and cost, in addition to eliminating the need for writing complex code.

An example of MDD is the development of complex real time embedded software systems using the real time profile of UML (UML-RT). Development of this software is difficult mainly due to timing constraints in a resource constrained environment. Adequate consideration of these timing constraints is very important for ensuring the integrity and reliability of a real time software system. Papyrus for Real Time (Papyrus-RT) is an open source modelling environment, which is used to model complex real time system using UML-RT language.

In our thesis, we have taken a rover, an autonomous embeded system vehicle as our case study. We are customizing Papyrus-RT by adding new features to facilitate model-based development of rover software. The goal of the project is to streamline the process of developing rover software using Papyrus-RT by making it more user-friendly and simpler. One of the key research outcomes is a highly customizable configuration page in the multi-editor panel of Papyrus-RT. The configuration page provides a centralized visualization of all the design parameters when designing the software for the rovers. Further, it also serves as a single point for all the design modification and customizations.

Finally, as a proof of concept a fully functioning rover is constructed, and the code that is generated through the customized version of our tool is used to drive the Rover.