A SysML based design pattern for the high-level development of mechatronic systems to enhance re-usability

Abstract:
Model driven engineering approaches can be used to handle the complexity in the development of modern mechatronic systems, containing a multitude of mechanical, electrical/electronic and software components. However, up to now SysML, as standard systems engineering language, is not wide spread in industry yet. Reasons therefore are missing adequate guidelines for the modeling process as well as an unclear benefit of the created SysML-models. A well-created system model however poses enormous time advantages during the analysis of change influences in later lifecycle phases of the system and makes an interdisciplinary reuse of modules in the development of new systems possible. A prerequisite therefore is the efficient traceability of all information within the system model. Thus, in this paper a SysML based process for the high-level development of mechatronic systems is applied, reaching from requirements specification to the detailed modeling of the element-connections (discipline specific as well as interdisciplinary). Our approach shows how the information from the different levels of abstraction and the different development phases can be connected, including a functional modularization of the mechatronic system. In this way, developers can trace change influences more easily.
The functional modules can be used during the development of new systems, resulting in significant shortened development cycles.
The proposed design pattern is shown at the example of a bench-scale model of a production plant.
Occurences:
  · Kollektionen > SFB 768 / Zyklenmanagement von Innovationsprozessen > Publikationen

entries: