

Generating Functional Mockup Units from Software Specifications

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This paper presents how we employed the *Functional Mockup Interface* (FMI) in order to integrate discrete model-based real time protocol specification with controller design and appropriated simulation facilities using Modelica/Dymola. The specification language which we use is called MechatronicUML. In MechatronicUML, the system model is structured hierarchically and consists of components. The component model differs from other component-based approaches, as MechatronicUML employs active components, i.e. the behaviour of each component is specified by a real-time statechart. Figure 1 shows the provided tool support with editors for real-time statecharts and structured component diagrams.

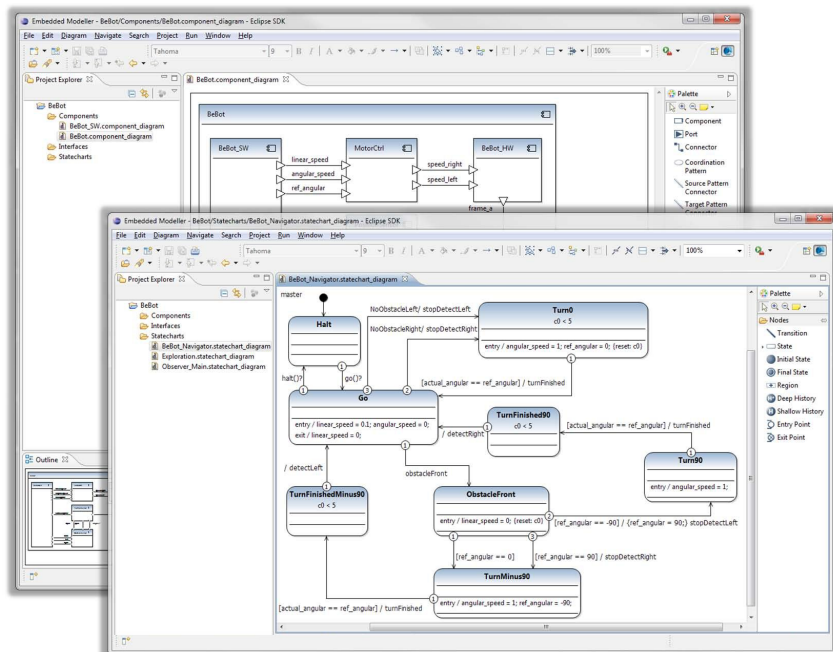


Figure 1: EMBEDDEDMODELLER

The approach has been developed as part of the ENTIME project (ENTIME is the German acronym for 'Design Methods for Intelligent Mechatronics'). The project aims at the development of a seamless methodology reaching from conceptual design to concrete implementation of mechatronic systems. It is carried out in close cooperation with nine industrial partners. To support simulation of the physical models and corresponding feedback loops together with specifications of real-time protocols, the main challenge was to provide the needed tool support, because the project collaborators use different modeling and simulation tools in their industrial practice.