A Real-Time Design Pattern for Actuators in Advanced Driver Assistance Systems

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Abstract

Advanced Driver Assistance Systems are hard real-time control systems in the automotive domain. They consist mainly of data acquisition, decision and action subsystems. The action subsystem constitutes a complex system which is composed of several embedded devices. The design of these systems is considered to be a complex process, as all components and real time constraints have to be considered during the design. Failures in hard systems could result critical situations. To tackle this problem, the design patterns present a reuse solution that improves the quality of the development process and reduces the complexity of systems design. However, the patterns which exist in the literature are abstract and do not represent the advanced driver assistance systems. In this paper, we focus on defining a specific real-time design pattern for an action subsystem of an advanced driver assistance system. This pattern captures the structural and the behavioral aspects. The definition of this pattern is based on a development process. To make this pattern more flexible and understandable, we add some semantics to the UML concepts using an UML-Profile, which expresses the realtime elements of the pattern and its variability.

References:


