Discovering timing feature interactions with timed UML 2 interactions

BACKGROUND: Timing properties are hard to specify, and even harder to analyse as interactions may arise from multiple independent properties. OBJECTIVE: We introduce the notion of timing feature interaction (TFI), and show how to automatically detect many TFIs. METHOD: We identify common structural patterns of timing specifications and show how they can be translated into UML 2 interactions with time constraints. We define a semantics that allows us to define and check coherence and consistency conditions of timing specifications. RESULTS: We provide a systematic process for mapping timing requirements into timed UML interactions and algorithms for checking their coherence and consistency. CONCLUSIONS: With our approach, it becomes easier to check and validate timing specifications. It is not our ambition to achieve complete coverage, i.e., discovering all timing specification defects. Instead, we focus on practical specifications that have numerous but comparatively simple properties.

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