

Temporally Expressive Scenarios in ScenarioML

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Abstract

Sequential, non-overlapping events are the norm in traditionally-expressed scenarios and use cases, but the world is much more fluid. Events have duration and may overlap, be separated in time, begin or end together, or have various other specific temporal relations. The ordering of the events may be completely known or partially uncertain, resulting in any of a large (but finite) number of relations for any two events. These relations, which can be formally stated and manipulated, are separable in form and meaning from the events themselves, which in requirements are most often expressed in prose. The temporal relations and partial ordering of events can be a significant part of what is specified, and must be inferred by a reader if not explicitly expressed. This paper presents a scenario language, ScenarioML, which expresses requirements scenarios using a broad and effective selection of event relations and structures. ScenarioML scenarios range from concrete scenarios to parameterized schemata that represent large families of scenarios related in a variety of temporal and structural ways. The language is designed for automated analysis and operations on temporal event relations, as well as other aspects of scenarios. An example from aircraft navigation is presented.