Enabledness-based Testing of Object Protocols

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Abstract. A significant proportion of classes in modern software introduce or use object protocols, prescriptions on the temporal orderings of method calls on objects. This paper studies search-based test generation techniques that aim to exploit a particular abstraction of object protocols (enabledness preserving abstractions, EPAs) to find failures. We define coverage criteria over an extension of EPAs that includes abnormal method termination and define a search-based test case generation technique aimed at achieving high coverage. Results suggest that the proposed case generation technique with a fitness function that aims at combined structural and extended EPA coverage can provide better failure-detection capabilities not only for protocol failures but also for general failures when compared to random testing and search-based test generation for standard structural coverage.
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