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RESEARCH ARTICLE

Coverage Analysis and Chinese Postman Algorithm for Efficient Model-Based Test Generation

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Abstract— The software testing activity aims to check whether an implementation behaves according to the specified system requirements. Model-based testing is an important black-box testing approach based on formalisms to specify critical and reactive systems. In a black-box approach the internal structure of an implementation candidate is unknown by the test designer. Thus, an implementation receives stimuli from the environment and produces autonomous outputs. Good software testers cannot avoid models. They construct mental models whenever they test an application. They update their mental model of the application and apply new tests according to the model. MBT calls for explicit definition of the model, either in advance or throughout the testing endeavour. However, software testers of today have a difficult time planning such a modelling effort. They are victims of the ad hoc nature of the development process where Requirements change abruptly. Testers who have only a few hours or days to test will most often opt to maintain their models in their head and perform testing manually. Today, the scene seems to be changing. Modelling in general seems to be gaining favour in fields where quality is essential and low quality software is not an option. Henceforth, we have introduced Extensive coverage analysis methods and a Guided Chinese Postman Algorithm for generating Test Cases.

Key Terms: - Model Coverage Analysis; MBT; Chinese Postman Algorithm; State charts; extended MBT

Full Text: http://www.ijcsmc.com/docs/papers/April2013/V2I42013112.pdf