

Invited Talk

Using Metaheuristic Search for the Analysis and Verification of UML Models

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Abstract. There is a growing research activity around the use of metaheuristic search techniques (e.g., genetic algorithms) in software engineering, for example to support test case generation. This is often referred to as search-based software engineering and is the subject of an international conference every year. This presentation will reflect on several years of research, involving several collaborators, that has focused on using metaheuristic search to support the analysis and verification of UML models and its extensions such as MARTE and OCL. Examples include the analysis of real-time deadlines (schedulability analysis), concurrency problems, and constraint solving, for example for supporting model-based test case generation. Results suggest that applying metaheuristic approaches to these problems lead to practical and scalable solutions that rely solely on UML and extensions, and does not require translations into other languages and formalisms. This latter property is of high practical importance in industrial practice.