عنوان مقاله:

Genetic Algorithm Action Selection Mechanism in Self adaptive Software Systems

محل انتشار:

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خلاصه مقاله:

this paper focuses on planning process of self-adaptive systems. Planning process leads to solve an action selection problem. Action selection mechanism should select action(s) to conduct our adaptable system to achieve its objectives in optimized manner called self-optimization. In this way, firstly we define a goal-driven model based on an architectural approach, and secondly, we design a decision-making mechanism based on genetic algorithm (GA). The mechanism selects the adaptation action(s) based on the model. Because goals play a key role in this problem, the problem can be viewed as a goal-driven problem, which means the decision-making mechanism should coordinate the preferred actions of these goals. The action selection mechanism base on GA is evaluated using experiments on a simulated system in simulink/matlab and compared with random and rule-base action selection based on three metrics consists of optimization metric (OM), number of function evaluation and scalability metric. The findings show scalability, and flexibility of proposed approach specially to increasing number of actions or goals or modifying goal priorities in compare to rule-base mechanism is remarkable. Aslo evaluated metrics of GA mechanism is usually lower than random and rule-base mechanisms which show higher efficiency of this approach.

کلمات کلیدی:

software architecture, self adaptive systems, self optimization, genetic algorithm, goal driven model, action selection mechanism

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