

Abstract: Applying Gray-Box based Software Requirements Specification Method to a Robot Patrolling System

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Abstract

In the case of software requirements for business application, most of the requirements can be captured by black-box based specification methods (i.e., use case modeling, or scenarios etc.) because most of the system behaviors are exposed to outside. On the other hand, in the case of embedded systems, it is hard to grip a tangible requirements set with the black-box based methods because most of the system behaviors are hidden from outside. If we can have a fully cultivated analysis model in requirements engineering phase, we can elicit requirements from the analysis model. However, it does not make sense considering the fact that the requirements engineering phase is preceded by analysis phase. To solve the problem of software requirements specification in embedded systems, we introduce a gray-box based software requirements specification method. In the proposed method, the guidelines to construct an initial analysis model which can be utilized as a source of requirements elicitation are provided and a way to automatic generation of software specification is introduced. In this article, we also present our experiences as a case study on how we can specify a robot patrolling system with the gray-box based specification method and what benefits we can get by applying the method on the robot patrolling system development.

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