

Object-Oriented Programming semantics representation utilizing agents

ABSTRACT

Comprehending Object-Oriented Programming (OOP) is not an easy task especially by novice students. The problem occurs during the transition from learning fundamental programming language concept to OOP concept. It is very important to handle this problem from the beginning before novices learn more advanced OOP concepts like encapsulation, inheritance, and polymorphism. Learning programming from source code examples is a common behavior among novices. Novices tend to refer to source codes examples and adapt the source codes to the problem given in their assignments. To cater the problems faced by these novices, a novel agent-based model have been designed to assist them in comprehending OOP concepts through source codes examples. The instructor needs to provide two related source codes that are similar but in different domain. Generally, these source codes go through the preprocessing, comparison, extraction, generate program semantics and classification processes. A formal algorithm that can be applied to any two related Java-based source codes examples is invented to generate the semantics of these source codes. The algorithm requires source codes comparison based on keyword similarity to extract the words that exist in the two related source codes. Three agents namely SemanticAgentGUI, semanticAgent and noviceAgent are designed in the proposed model. The running system shows an OOP semantic knowledge representation by intelligent agents.

Keyword: OOP semantics; Source codes comparison; Keyword similarity; Extraction; Classification