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Multiplicity Doctor: A Diagnosis Tool for Clarity and Consistency of the Multiplicity in a Static UML Model

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Abstract

We have developed a system that diagnoses issues of clarity and consistency between a class diagram and instance diagrams. Our system helps beginners create an understandable model for Object-oriented modeling education. The system checks a given diagram to ensure that it is mutually consistent in multiplicity and that the multiplicity is unambiguous. We conducted a control experiment with 13 students in which only the experimental group was allowed to use the proposed system. The results of the experiment showed that the scores for the experimental group were higher than the control group, whereas the average times for finishing tasks were similar between the groups. We also confirmed by a qualitative analysis of students' recorded procedures that the proposed functions for checking both consistency and clarity successfully supported students in the experimental group.

Keywords

modeling education, diagnosis, object diagram, inconsistency, clarity, multiplicity

Biographies



Yoshiaki Matsuzawa received his PhD in Media and Governance in 2008 from Keio University, Japan. He is an assistant professor in the Faculty of Informatics at Shizuoka University. His research interests include software-engineering education, educational software development, modeling and simulation of complex systems, and learning sciences.



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