Formalization of Dynamic Model for Object-Oriented Methodology

Kei Itou
School of Information Science
Japan Advanced Institute of Science and Technology

January 16, 1998

Abstract

In this paper, we introduce a specification model ObTS and a specification language ObCL for dynamic model of Object-Oriented Methodology. Then we propose an Event Dependency Graph(EDG) as a formalization of communication of dynamic model, and argue characterization and comparison of communication models under EDGs.

Firstly, we introduce a specification model ObTS to describe formally the whole dynamic model using the concept of object-orientedness, and we give semantics to ObTS based on Statechart-type communication model used in CASE tool Statemate. Then we introduce a language ObCL for ObTS model, and build a CASE environment for description and simulation of ObCL.

Secondly, we propose an Event Dependency Graph(EDG) to characterize and specify communication and interaction among objects. EDG is a graph describing dependency among state transitions of objects. As EDG could be defined for any object system, it could be used to characterize, compare and specify communication models in object systems. We show that some class of EDG's corresponds to Statechart, and Statechart and asynchronous models have equivalent power with respect to EDG.

Key Words: Object-oriented, specification, formalization, Statechart