Presentation Abstract

The Synchronized Ambient Calculus

Toru Kato[1,a)]   Yoichi Hirashima[2,b)]

Presented: June 11, 2021

We propose a process algebra called "the synchronized ambient calculus (SAC)", which is an extension of the ambient calculus (AC). The processes of AC have a layered structure of ambients that enable us to describe not only mobile processes but also real entities such as networks and freight systems, in which synchronization between objects is crucial. For example, a container must be brought out from a container yard just after the container ship reached the terminal. While such a protocol can be described using the primitives (in, out, open) of AC, the protocol is easily corrupted due to the phenomenon called "grave interference", which led us to design SAC. The following advantages for using SAC are that we can describe synchronized actions of objects without grave interference, expressions for such synchronized actions can be simpler than using AC, and the problem for an equational theory can be expressed more easily than our previous work. We give an example of SAC processes for stacking containers in constrained shipping order, e.g., in ascending order, the execution sequences of which can be used to improve the efficiency of the reinforcement learning method we are currently developing.