

# UML MODELLING AND CODE GENERATION FOR AGENT-BASED, DISCRETE EVENTS SIMULATION

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## ABSTRACT

GeneSim is an open-source research project about software simulation of dynamic systems. The project focuses on UML as modelling language and on automated tools to generate the simulator from the UML model. This paper presents an implementation of this approach applied to *Agent-based Discrete Event* simulation. The system to be simulated is described by a set of UML diagrams which specifies an object-oriented model of the system. From such UML model it is possible to derive C++ source code by applying a set of defined code generation patterns. A C++ library provides the runtime environment that, compiled and linked with the generated code, results in the executable system simulator. The code generation process can be automatized: the UML diagrams are encoded in XML documents which are readable by an ad hoc compiler that uses XSLT transformations to actually generate the C++ code.

Keywords: UML, agent-based simulation, discrete event simulation, code generation.

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