Engineering Ensembles

Today's developers often face the demanding task of developing software for ensembles: systems with massive numbers of nodes, operating in open and non-deterministic environments with complex interactions, and the need to dynamically adapt to new requirements, technologies or environmental conditions without redeployment and without interruption of the system's functionality. Conventional development approaches and languages do not provide adequate support for the problems posed by this challenge.

The goal of the ASCENS project is to develop a coherent, integrated set of methods and tools to build software for ensembles. To this end we research foundational issues that arise during the development of these kinds of systems, and we build mathematical models that address them. Based on these theories we design a family of languages for engineering ensembles, formal methods that can handle the size, complexity and adaptivity required by ensembles, and software-development methods that provide guidance for developers ... read more