Student Research Assistant (HiWi)

EU Project Allow Ensembles – Collective Adaptive Systems

Beginning: immediately

Background
The EU Project Allow Ensembles aims to develop a new design principle for large-scale collective adaptive systems (CAS) [2] based on the concepts of cells and ensembles, where cells represent a concrete functionality in a system, and the ensembles are collections of cells which collaborate in order to fulfill a certain goal in a given context. Adaptive Pervasive Flows (APF) are based on workflow technology and utilized in pervasive environments to model the cell’s behavior.

Two different modeling and specification levels are identified in the interactions that occur within a CAS: local and global. The former comprises the concrete and local functionality of a cell, and therefore can be specified using the WS-BPEL [1] specification and its available extensions (e.g. context-aware and flexibility). On the other hand, the latter demands a global view and specification of the cell interactions in the scope of an ensemble, and therefore can be specified using choreographies specified, e.g., in BPEL4Chor [7, 8].

Tasks

- Business process modeling and specification using WS-BPEL for the use cases discussed in Allow Ensembles
- Choreography modeling and specification using BPEL4Chor for the use cases discussed in Allow Ensembles
- Specification of customized extensions of WS-BPEL and implementation of their behavior in the Apache ODE Engine [4]
- Integration of prototypes in the overall execution environment developed for Allow Ensembles

Required previous knowledge and experiences

- Java programming skills and expertise
- Apache ODE Orchestration Engine [4]
- Enterprise Service Bus – Apache ServiceMix 4.3 [3]
- XML Transformation, e.g. XSLT, etc., and/or XML parsers, e.g. DOM, SAX, etc.
- ...or the declared intention to deeply dive into these topics in advance

Demonstrated experience in business process modeling (using the Eclipse BPEL designer [9] or similar) and execution (using the Apache ODE Engine [4] or equivalent) is required.
Literature


Contact

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