
A Contract and Facet Based Method for Modelling and Verification of Heterogeneous Systems

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Résumé

With the continuous expansion of concurrent and distributed systems, Component Based Software Engineering still have a great importance. For constructing these systems which do not have a precise boundary. They are open and made of various specific components built with different languages and environments. The modeling, assembly, analysis and maintenance of such open and complex heterogeneous systems are still challenging in software engineering. The components of heterogeneous systems may cover various concerns, ranging from their nature (software or physical devices), their offered functionalities, to their specific features. The composition of these components should be flexible, and it must be adapted to the reused components and to their local features, whatever the origin of these components. We propose a method for modeling, composing and verifying heterogeneous systems. The method consists in: equipping individual components with generalized contracts that integrate various facets related to different concerns; composing these components according to their facets and verifying the resulting system with respect to the involved facets as well. We illustrate the use of the method with a case study. The proposed method may be used or extended to cover more facets, and by strengthening assistance tool through proactive aspects in modeling, composing multi-facets contracts and finally the verification of the heterogeneous systems.

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