

A FORMAL SETTING FOR VIEWPOINT COMPOSITION

—PHD POSITION AT ONERA, TOULOUSE, FRANCE—

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Subject: A current approach to the engineering of *systems* (software systems, sociotechnical systems, systems of systems, etc.) consists in modeling them, during specification and design phases, according to various *viewpoints*. This approach aims at helping engineers handle extremely complex systems by providing them with a view corresponding to their sole business (*e.g.* air or space regulation, dependability, realtime performance, etc.), abstracting from other concerns. Of course, the viewpoints that are useful may strongly vary on the context, henceforth entailing the recurring definition of new multi-view modeling languages. This definition is usually *ad-hoc*, which forces language designers either to ignore semantic matters and remain on a purely syntactic definition, or to propose a new formal semantics and demonstrate a certain number of otherwise standard results.

The aim of this PhD is to propose a theoretical setting to assist in the creation of multi-view languages out of “small” predefined modeling languages (each one being concerned with only one topic). The major question is then to determine under which conditions it is possible to deduce the formal semantics of the multi-view language from the semantics of its constituent languages. Another way to state this problem is to say that we aim at providing a formal semantics to aspect-oriented metamodeling.

The foreseen theoretical solutions essentially rely on categorical approaches: algebraic specification, theory of institutions, graph grammars, etc. The results of the PhD will be backed up by a case study and may be implemented in a software prototype.

Candidate profile: MSc in computer science or in logic, having followed some “theory” courses (*e.g.* logic, λ -calculus, process algebra, algebraic specification, etc.). Fluency in English.

Gross salary: ranging 1680-2140 € /month depending on the profile. 3-year position.

Localisation: Onera is the French Aerospace Research Center, affiliated to the French Ministry of Defence. The PhD will be carried out at Toulouse premises. Located in southwest France, Toulouse is a lively city, the 4th most important town in France, and the 2nd one as far as the student population is concerned (see <http://en.wikipedia.org/wiki/Toulouse>).