

Rigorous Software Construction

SOFTWARE SYSTEMS / PLASTIC Team



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Research Interests:

- Semantics of concurrent and distributed systems
- Formal models for long running transactions

Objectives

Formal calculi for systems semantics and rigorous software construction

In global computing software systems have to deal with: the ever increasing number of connected devices; applications that need to consult and update distributed data; the user's expectations that applications should be able to deal with the occurrence of unexpected events.

In this context my research is focused on developing formal languages, calculi, and techniques for addressing the issues of error recovery, data confidentiality, and data consistency.

Methodology

Use formal calculi to understand a software system, describe its semantics, and reason about its properties, namely:

- Define the abstractions that represent the issues under study;
- Develop languages and calculi to express the relevant abstractions and to study the underlying system behaviour;
- Develop analysis techniques, either through the use of logics or type systems, to reason about system properties.

Expected Results

- Programming languages with sound foundations
- Prototypes of verification tools that check if a system has the expected behaviour
- Well founded techniques to develop correct by construction software (e.g. refinements techniques)

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