

STIC-AmSud - Formal Development of Computer Programs and Applications

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Característica: Proyecto de cooperación internacional Brasil - Argentina - Francia

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Resumen:

Computer systems are becoming more and more complex. This brings along new challenges to the computer science community in terms of security, correctness, interoperability and more.

We propose three convergent lines of research focused on the development of the operational semantics of modern foundational theories of programming languages.

The first one explores extensions of the lambda- calculus with explicit substitutions. In particular, we are interested in a new approach, known as structural lambda-calculus that was inspired in MELL Proof-Nets and whose evaluation rules act at a distance, and the substitutions are no longer propagated over terms.

The second one concerns the Pure Pattern Calculus, which is a mechanism based on pattern-matching that supports new forms of polymorphism. In fact, the pattern calculus introduces two forms of polymorphism, named path polymorphism and pattern polymorphism that treat in a uniform and simple way all kinds of data structure.

Finally, the third line of research integrates the first two, and is about the formalization in proof assistants of the results obtained. Proof assistants provide a specialized environment where mathematical proofs are built to certify properties.