DEPARTAMENTO DE INFORMÁTICA

Liveness, statically.

SOFTWARE SYSTEMS / PLASTIC Team

CHi — CENTER FOR INFORMATICS AND INFORMATION TECHNOLOGIES

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Interests:
- Logic in Computer Science
- Semantics of programming languages
- Theory of concurrent and distributed systems

Objectives

The main objective of my present research is the development of automatic solutions to guarantee not only safety, but also liveness properties of distributed, collaborative, communication-centred, software systems and applications.

Safety - "nothing bad will happen" - is a fundamental property of systems. However, only liveness - "something good (desired) will eventually happen" is crucial to ensure that a system actually fulfills its intended role.

Our aim is to design and implement systems that go beyond the present scenario, mainly restricted to safety.

Methodology

Define behavioural notions of types, capturing dynamic aspects of programs:
- language (syntax)
- evolution and meaning (semantics)

Define type systems for programming languages, using behavioural types and ensuring both safety and liveness properties

Implement the systems and test with case studies

Expected Results

Expressive languages of types with solid logical foundations

Programming languages equipped with type systems able of guaranteeing properties like absense of deadlocks, termination, and determinism

Development of solutions (as systems implementations) to provide safe and correct (mobile) applications and services