

DEPARTAMENTO DE INFORMÁTICA

Safe and Secure Software Systems

SOFTWARE SYSTEMS / PLASTIC Research Team



João Costa Seco

Assistant Professor

PhD 2006 – UNL

Teaches programming languages and compiler related topics.

Researches language based security, concurrency, and software evolution.

Objectives

How to ensure that applications do **not leak confidential information** to non-authorized users? What techniques allow expressing and verifying **access control and information flow** in web applications?

How to ensure that Applications do not **crash, loose data, or stop responding**? What tools check the absence of execution errors on distributed and concurrent systems.

How to ensure that an application can be **updated with no down time**? What programming language principles capture the intuition of data flow in a web application and allow automatic propagation of code and data modifications?

Methodology

To use precise and formal techniques in the design and implementation of programming languages, that provide “correctness by construction” guaranties.

To express safety and security properties of software systems in logic based (type) specification languages and deduction systems that allow mechanical verification.

To build verification tools that assist the software developer to program better, faster, and safer software systems, specially in complex and critical scenarios.

To design and build languages and runtime support systems that allow live construction and safe updates of code and data.

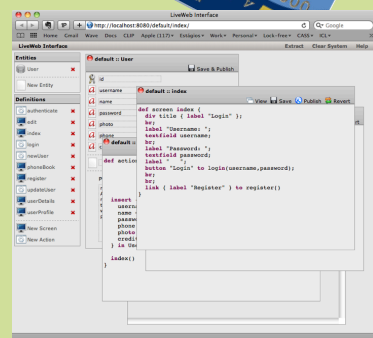
Projects and future directions

Interfaces - Certified Interfaces for Integrity and Security in Extensible Web-based Applications (2009-2012, FCT/CMUPortugal, PI Luís Caires)

Streamline – Thread-Safety by Typing for Mainstream Concurrent Object-Oriented Programming. (2010-2012, FCT, PI)

Research Directions: Concurrent programming languages, Security in data-centric applications, Live Programming

PhD Students: Miguel Domingues (2010 - ...), Miguel Lourenço (2011 - ...)



Funding:

