

POP Seminar

The Type Discipline of Behavioral Separation

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Abstract:

We introduce the concept of **behavioral separation** as a general principle for disciplining interference in higher-order imperative concurrent programs, and present a type-based approach that systematically develops the concept in the context of a lambda calculus extended with mutable state, concurrency, and synchronization primitives.

Behavioral separation builds on notions originally introduced for behavioral type systems and separation logics, but shifts the focus from the separation of static program state properties towards the separation of dynamic usage behaviors of runtime values.

We illustrate how our type system, even if based on a small set of fairly canonical primitives, is already able to tackle challenging program idioms, involving aliasing at all types, concurrency with first-class threads, manipulation of linked data structures, behavioral borrowing, and invariant-based separation.

Luís Caires (joint work with João C. Seco) based on work to be presented at POPL'13.

Research Interests:

- Software Construction, Environments and Tools;
- Programming Languages, Calculi, Logics and Types;
- Concurrency, Distribution, Mobility, Security;
- Cloud and Service based computing software;

Friday, December 7, 2012
Gates Hillman Center 7501
2:30 PM – 4:00 PM