Title: On dynamic flow-sensitive floating-label systems

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Abstract:

Flow-sensitive analysis for information-flow control (IFC) allows data structures to have mutable security labels, i.e., labels that can change over the course of the computation. In this talk, I will present a dynamic enforcement that safely handles flow-sensitive references in the context of LIO, a language-level floating-label IFC library for Haskell. This approach naturally extends to the concurrent setting, not previously considered by dynamic flow-sensitive systems.

The key insight to safely manipulating the label of a reference is to not only consider the label on the data stored in the reference, i.e., the reference label, but also the label on the reference label itself.

As a surprising result, I will show that this enforcement can be embedded into flow-insensitive LIO, essentially allowing us to incorporate flow-sensitivity into an existing floating-label system without having to extend the core calculus.