

Abstract:

Semantic models of Storage

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Imperative programs carry out computations by manipulating variables in the store. Out of such variables, we build powerful programming abstractions including sophisticated data representations, models of real-life objects, secure pieces of information, access control mechanisms etc. Which part of the store are available to which parts of the program, is an important question to be addressed in building semantic models of the store. In this talk, we review the decade-long research into this issue, starting with the insights obtained in modelling local variables and covering the more recent application of these ideas to heap variables.

The focus is on “information hiding” or “access control.” The traditional denotational semantics, covered in typical text books, essentially allows every computation to access every storage location. In other words, it does not model access control. Better semantic models have been defined using the ideas of possible worlds, relational parametricity, trace-based observable behavior and game semantics. We give an overview of these techniques and review the current research and open problems.

