

Designing of a 0-CFA

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Résumé

Control flow analysis consists in detecting where channels can be used in a mobile system. In particular 0-cfa is a flow insensitive version of this analysis. This week, we propose to design a 0-cfa for the π -calculus.

Formally, 0-control flow analysis (0-CFA) of a system consists in over-approximating the set of pairs (x, y) such that the name of a channel that is opened by the restriction $(\nu \ x)$ may be associated to an instance of the variable y in one instance of a thread of the system.

For instance, in the process :

$$(\nu \ x) (\nu \ a) (a!^1[x] \mid a?^2[y] . P(y))$$

the name of a channel created by the restriction $(\nu \ a)$ may flow in the instances of the variable a , the name of a channel created by the restriction $(\nu \ x)$ may flow in the instances of the variable x and y .

The most precise result for a 0-cfa on this example is the following :

$$\{(a, a), (x, x), (x, y)\}$$

Question 1 *Design a 0-cfa for the close systems of the π -calculus.*

Question 2 *Which assumptions can be done, so as to improve the accuracy of the analysis, without restricting the set of processes which can be analysed.*

Question 3 *Extend the analysis to the case of an open system, which can communicate with some other unknown threads.*