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What is decidable in growth-rate analysis of programs?

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Resumen

Growth-rate analysis is the problem of finding, for a program in a suitable programming language, how fast the computed values, or the running time, etc., grow as a function of the input. We concentrate on decision problems like: do the values grow at most polynomially in the input? In this talk I will survey research starting with a CiE 2008 paper where Jones, Kristiansen and I presented an algorithm that, for a simple but non-trivial imperative programming language, answers the polynomial and linear growth-rate questions. The interesting part was that the algorithm solved the problem precisely---problems of this type are undecidable for ordinary, full languages, and even rather simple ones. The surprising part was that it ran in polynomial time.

Consequently, we have tried to explore the boundaries of tractability and decidability in the vicinity of our original problem, that is, to consider modifications to the programming language and study their effect.

Sobre Amir Ben-Amram

Amir Ben-Amram has MSc and PhD degrees in Computer Science from Tel-Aviv University, where he studied under Prof. Zvi Galil.

Currently he's a professor at the Tel-Aviv Academic College. Much of his research in the last decade involves program analysis problems of termination and complexity. He is currently visiting the UCM, and collaborating with members of the COSTA group, with whom he has already co-authored several conference and journal papers.