EPFL-Inria
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ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Inria
INVENTEURS DU MONDE NUMÉRIQUE

Workshop EPFL-Inria
15 et 16 février 2018, Paris

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Title: « New Algorithms for Static Analysis via Dyck Reachability »

Abstract:
Static analysis is a lightweight form of program verification, where the analyzer performs clever scans of the source code and establishes useful facts about its execution, without actually executing the code. The standard way to express a plethora of static analysis problems is via Dyck reachability, which is a generalization of graph reachability. In the talk, I will outline a collection of recent algorithmic advances on various versions of the Dyck-reachability problem related to data-flow, data-dependence and alias analysis. The new algorithms significantly outperform existing approaches both in theory and practice, and are particularly well-suited for dynamic and on-demand analyses. I will conclude with some open questions and persistent challenges.