It is an open problem in static resource bound analysis to connect high-level resource bounds (order of complexity) with the actual execution time and memory usage of compiled machine code. We propose to use machine learning to derive a cost model for a high-level source language that approximates the execution cost of compiled programs, including garbage collection, on a specific hardware platform. The technique has been implemented for a subset of OCaml using Inrias OCaml compiler on an Intel x86-64 and ARM 64-bit v8-A platform with execution time and heap allocations being the considered resources. In this talk, I will define cost semantics, motivate and describe our machine learning approach and finally present the evaluation of our technique on several benchmarks.

Joint work with Jan Hoffmann