ProGraML: Graph-based Deep Learning for Program Optimization and Analysis

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Abstract—Compiler architects increasingly look to machine learning when building heuristics for compiler optimization. The promise of automatic heuristic design, freeing the compiler engineer from the complex interactions of program, architecture, and other optimizations, is alluring. However, most machine learning methods cannot replicate even the simplest of the abstract interpretations of data flow analysis that are critical to making good optimization decisions. This must change for machine learning to become the dominant technology in compiler heuristics.