

2018 Research Interest/Project Ideas

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On-Stack Replacement for High-Performance Query Compilers

Cutting edge database systems contain sophisticated compiler back-ends that generate highly efficient LLVM or native code. Our own Flare and LB2 systems yield 10x-100x speedups over Postgres and Spark, for example. However, query compilation time can itself become a bottleneck. In this project, we plan to apply techniques from JIT compilers for dynamic languages to query engines that will allow replacing the code of a running query with another version. This way, a lightly optimized version can start running quickly, while another version is being compiled with heavier optimizations. Once compilation finished, the running code can be replaced, amortizing the compilation cost.