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**PREDICTING CROSS-CORE PERFORMANCE INTERFERENCE ON MULTICORE PROCESSORS WITH REGRESSION ANALYSIS**

**ABSTRACT:**

Despite their widespread adoption in cloud computing, multicore processors are heavily under-utilized in terms of computing resources. To avoid the potential for negative and unpredictable interference, co-location of a latency-sensitive application with others on the same multicore processor is disallowed, leaving many cores idle and causing low machine utilization. To enable co-location while providing QoS guarantees, it is challenging but important to predict performance interference between co-located applications. We observed that the performance degradation of an application can be represented as a piecewise predictor function of the aggregate pressures on shared resources from all cores. Based on this observation, we propose to adopt regression analysis to build a predictor function for an application. Furthermore, the prediction model thus obtained for an application is able to characterize its contentiousness and sensitivity. Validation using a large number of single-threaded and multi-threaded benchmarks and nine real-world datacenter applications on two different platforms shows that our approach is also precise, with an average error not exceeding 0.4 percent.