**CAASCADE: Understanding HPC Applications for Evidence-based Co-design**

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**Abstract**

With the increasing complexity of upcoming HPC systems, so-called “co-design” efforts to develop the hardware and applications in concert for these systems is also becoming more challenging. It is currently difficult to gather information about the usage of programming model features, libraries, and data structure considerations in a quantitative way across a variety of applications, and this information is needed to prioritize development efforts in systems software and hardware optimizations. This poster summarizes CAASCADE, a compiler-based system

that can harvest this information in an automatic way in production HPC environments, and we show some early results from a prototype of the system based on GNU compilers, a MySQL database, and Apache Spark analyses.