

## Modelling Search Engines Performance Using Coloured Petri Nets

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**Abstract.** This paper proposes using Coloured Petri Nets to model performance of vertical search engines for Web search. In such systems, queries submitted by users or client systems are handled by different components implemented as services deployed on large clusters of dedicated processors. We propose models that represent key features of components running time cost at a suitable level of detail. A comprehensive evaluation study is presented to reveal good precision of models when compared against actual implementations and complex process-oriented simulators of the same search engine instances. A C++ class library is proposed to enable rapid model construction by using a hierarchical and scalable approach, and to enable transparent generation and efficient execution of respective simulation programs either sequentially or in parallel.

**Keywords:** Web search engines, Petri net applications, performance evaluation and modelling.

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