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**“ANALYSIS OF QUANTITATIVE TIMING PROPERTIES OF SYNCHRONOUS
PROGRAMS USING DISCRETE DURATION CALCULUS”**

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ABSTRACT

QDDC is a logic for specifying quantitative timing aspects of synchronous programs. Properties such as worst-case response time and latency can be specified elegantly in this logic. Many of these properties require finding the least/greatest value of a parameter k making a formula $D(k)$ valid for a program.

In this paper, we discuss how an automata theoretic decision procedure for QDDC together with symbolic search for shortest/longest path can be used to "compute" the optimal (least/greatest length) models of a formula D . These techniques have been implemented into the DCVALID verifier for QDDC formulae. The implementation is built on top of the symbolic search routines for shortest/longest paths available in the NuSMV verifier. We illustrate the use of this technique by computing (a) response/loss time of some synchronous bus arbiters, and (b) optimal schedules for some job-shop scheduling problems using our tool DCVALID and NuSMV.

For more information please visit: <http://www.tcs.tifr.res.in/~pandya/>