Performance Measures Other Than Time

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This text reports some thoughts we had about interesting performance measures that are not just "execution time".

1 Examples of performance measures

We collected examples of performance measures and found the following:

	cumulative measures	rate measures
physical measures	energy, radiation chip area reliability	power, heat production poison concentration bandwidth, frame size
social measures	money man-years	number of full-time employees

For *radiation,* we thought about radioactivity: the cumulated amount to be absorbed by a person should not exceed a given threshold. For *poisons,* however, laws often prescribe maximal allowed concentrations. *Reliability* can be quantified as a cumulation over the number of working system components (if system components are redundant).

Additionally, we found the following measures which we couldn't classify in the above table:

- *Memory or buffer size:* Peak memory usage can be seen as a rate measure, but the total amount of data collected by some process is a cumulative measure.
- Time-related measures: *latency, reconfiguration time.* We mention these because they measure some time intervals and therefore are more complex than just the total execution time.

2 Possible Objectives

We found the following objectives that one might find interesting to calculate.

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- *Minima* or almost-minima can be found by heuristic searches.
- *Distributions* and quantiles: stochastic model checking finds single points of a distribution. Statistical analysis of a simulation produces an approximation of the distribution.
- One might want to *optimize* parameter values w. r. t. some distribution or quantile. Parametric model checking might be a method to achieve this.
- *Expected values.*