

BOUNDS

(as guarantees, no a priori distribution on inputs)

DETERMINISTIC

worst case

- unreferenced w.r.t. OPT, non-amortized

approximation

- embed OPT within (constant) factor to algorithm, in worst case
- correctness proof often gives a factor to OPT solution (e.g. solution to NP-hard problem)
- competitive analysis gives a factor to OPT runtime (off-line)

amortized

- average over sequence of operations in worst case

PROBABILISTIC

expectation

- can also get probability bound with Markov inequality etc..

approximation in expectation

- embed OPT within a (constant) factor to algorithm, in expectation

with high probability

- error probability of event is polynomially small
- event description can have a bound

A randomized algorithm can be a starting point for designing a deterministic/derandomized algorithm (from expectation to worst-case bounds), and vice versa (e.g. keep correctness and improve time/space). Randomization does not seem to solve NP-complete problems in polynomial time though :)