

# Infinite Computations and Büchi Automata using Grossone

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**Abstract.** Traditional models of computation on finite strings can accept strings or produce a result of a computation (see, e. g., [2]). However, when a computation continues for an indefinite (infinite) period a different model of computation is needed. Büchi automata provide such a model of computation. Büchi automata are finite automata operating on infinite strings. A computation is successful (or accepted) by a Büchi automaton if, given a set of favorable states, a favorable state (or states) occur(s) infinitely often. However, there is no accounting for non-favorable states also occurring infinitely often. Hence, the meaning of a successful computation of Büchi automata can have lower than acceptable accuracy. In this talk, the new paradigm of the infinite unit axiom and grossone (see, e. g., [1, 3, 4]) is applied to extend the computational accuracy of Büchi automata and leads to a more accurate meaning of a successful computation on an infinite string.

## References

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