

## MONOTONICITY OF RESTARTING AUTOMATA

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### ABSTRACT

Restarting automata constitute a special class of regulated length-reducing rewriting systems. In this paper, several versions of these automata and a (strict) monotonicity property imposed on their computations are considered. This yields three natural possibilities for defining when an automaton is (strictly) monotonic. A taxonomy of the relevant language classes is provided, and the decidability questions for the studied properties are answered.

*Keywords:* Regulated rewriting systems, length-reducing rewriting systems, restarting automata, monotonicity

### 1. Introduction

This paper presents a continuation and completion of the results in [6], concerning monotonic restarting automata.

Our main motivation for studying restarting automata comes from linguistics, namely from modelling the *analysis by reduction* of natural language sentences (in

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