

OPEN PROBLEMS RELATED TO PALINDROME RECOGNITION: ARE THERE OPEN PROBLEMS RELATED TO PALINDROME RECOGNITION?

J. ANDRES MONTOYA

*Universidad Nacional de Colombia, Bogota
Calle 45 Carrera 30 ciudad universitaria
e-mail: jamontoyaa@unal.edu.co*

ABSTRACT

We study the recognizability of palindromes over different models of automata. We emphasize on the open problems related to this issue and we make some minor contributions. We prove, for instance, that the language of palindromes cannot be recognized in real-time employing a Turing machine provided with a single work tape.

Keywords: formal languages, automata theory, palindrome recognition, real-time computations

We study the language of palindromes from the point of view of automata theory. We survey some of the main facts concerning this issue and we include some minor contributions. We assume that the reader knows the basic definitions of automata theory: finite state automata, pushdown automata, context-free grammars, real-time and so on. The interested reader can check the excellent reference [16].

1. Introduction

We begin this introductory section with the definition of the language that is studied in this paper.

Definition 1 *Let Σ be a finite alphabet. We use the symbol Pal_{Σ} to denote the language*

$$\{w \in \Sigma^* : w = w^R\},$$

where given w , the symbol w^R denotes the reverse of w .

Remark 1 Most of the time we will omit the subscript Σ , and we will use just the symbol Pal to denote the language of palindromes over some given finite alphabet of size bigger than 1 (to denote the *generic* language of palindromes over a finite alphabet).