Journal of Automata, Languages and Combinatorics **7** (2002) 4, 519–531

DESCRIPTIONAL COMPLEXITY OF FINITE AUTOMATA: CONCEPTS AND OPEN PROBLEMS [1]

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ABSTRACT

"Automata theory is not over" is the message of this paper. But if one wishes a renaissance of automata theory, then one should prefer to return to the investigation of the fundamental, classical problems of automata theory rather then searching for new applications and defining numerous questionable modifications of basic models. We argue for this opinion here and try to outline a way that could lead to a renaissance of automata theory.

Keywords: Automata, regular languages, descriptional complexity

1. Introduction

Automata theory is one of the oldest areas of computer science. In the 1960's, 1970's and in the beginning of 1980's, automata theory was one of the few areas of main interest in theoretical computer science. The name ICALP (International Colloquium on Automata, Languages and Programming) of one of the few central conferences open to all areas of theoretical computer science confirms our claim that automata theory was considered to be one of the main-streams of computer science. In the last 15 years the situation essentially changed. Sheng Yu writes in his article [43] the following sentences:

"... in the last decade or so, automata theory has been regarded, in many computer science institutions, as not main-stream, out of fashion, and even useless. Many funding agencies have also followed the trend and became reluctant to support research projects in automata theory.

Is automata theory becoming less and less relevant to the current and pressing issues of computer science?

Is automata theory disintegrating into many different application areas and no longer necessary to be a separate major research area of computer science?"

[1] Full version of an invited lecture presented at the Third International Workshop on *Descriptional Complexity of Automata, Grammars and Related Structures* (Vienna, Austria, July 20 – 22, 2001).

[2] Supported by the common grant Nr. D/0133263 of DAAD and the Academy of Finland.