Journal of Automata, Languages and Combinatorics **19** (2014) 1–4, 45–56
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POWER OF CAUSAL DEPENDENCIES IN RULE BASED SYSTEMS

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ABSTRACT

In this paper we explore the computational power of a new formalism where causality is prescribed inside the system by using some causal sequences. The novel approach allows moving a first step towards a notion of *controllable* rule-based systems, opening new perspectives in practical usage of these bio-inspired systems.

Keywords: P systems, causality, computational universality

1. Introduction

Causality among occurrences of *happenings* is often regarded as an *observed* phenomenon, and the relations among these happenings are confined more on deductions on various observations rather than a *property* that either holds or not, and does not necessarily entirely relies on observations.

In control theory dependencies among happenings are also considered on an *external* level with respect to the system to be controlled. Even if the target in control theory is to forbid that something wrong may happen in the systems, the dependencies (causalities) among various activities are perceived as more subtle and elusive phenomena that cannot be confined to the level of observation. This is especially true in complex systems as the biological ones that can be modeled by using membrane