# Towards a programming language in cellular computing

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**Abstract.** Several solutions to hard numerical problems using P systems have been presented recently, and strong similarities in their designs have been noticed. In this paper we present a new one, an effective solution to the Partition problem via a family of deterministic P systems with active membranes using 2-division. We intend to show that the idea of a *cellular programming language* is possible, indicating some "subroutines" that can be used in a variety of situations and therefore could be useful for attacking new problems in the future.

## 1 Introduction

Cellular Computing is an emergent branch in the field of Natural Computing. Since Gh. Păun introduced it (see [4]) much work has been done, but not always with the same approach. Computer scientists, biologists, formal linguists and complexity theoreticians have contributed enriching the field with their different points of view.

The present paper is focused on the design of a family of P systems that solves a numerical NP-complete problem, namely, the Partition problem. The design of this solution is inspired in several previous works on other problems, mainly the Subset-Sum and the Knapsack problems but also the VALIDITY and SAT. The similarities between the design introduced here and the solutions presented in [6], [7], [9] and [11] will be highlighted and some conclusions will be extracted from them.

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