CALL FOR PAPERS

Special issue of

INTERNATIONAL JOURNAL OF FOUNDATIONS OF COMPUTER SCIENCE

on

Frontier between Decidability and Undecidability and Related Problems

Computability is one of the fundamental domains of computer science. Many questions remain open in this area and their solution is of great importance both for the advance of knowledge and for possible applications.

Many problems of real life in their present mathematical or theoretical modeling are undecidable. Most often, this means a lack of information. If enough information can be supplied, the problem may become decidable and then, the question arises of the complexity of solving algorithms.

How much information has to be supplied? This is an important question and we are at the beginning of an era where partial answers can be approached if not completely given. This is the main motivation of the topic **Frontier between decidability and undecidability**. At the present moment, the syntactic aspects of the limitation of information are considered. In this regard, substantial progress has been obtained recently, for instance, in the number of states and or symbols needed to construct a universal Turing machine. Important results about the same question and similar criteria have also been obtained in other models of discrete computations such as register machine, cellular automata and other abstract devices, some of them being connected with biology.

The same question can be attacked from a very different point of view starting from the old approach of analog computations. Recent progress was achieved in this trend which is vividly developing. Other trends also try to obtain superTuring computations which also constitute another look at the same question.

Accordingly, the special issue is planned to focus on the state-of-the art solutions about the frontier between decidability and undecidability and related problems. Topics of interest include but are not limited to:

> Digital Computations:
> Turing machines, register machines, cellular automata,
> other automata, tiling of the plane, polyominoes, snakes,
> neural networks, molecular computations, word processing
> (groups and monoids), molecular computing and other machines

Analog and Hybrid Computations:
BSS machines, infinite cellular automata, real machines,
quantum computing

In both cases:
frontiers between a decidable halting problem and an undecidable one in
the various computational settings,
Minimal universal codes:
size of such a code, namely, for Turing machines, register
machines, cellular automata, tilings, neural nets,
Post systems, P systems...
computation complexity of machines with a decidable halting
problem as well as universal machines,
self-reproduction and other tasks,
universality and decidability in the real field

Please, submit an electronic version of your submission as a .ps or .pdf file to
be sent electronically to one of the guest editors by December 31, 2010:

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		Computer Science

Schedule:

Deadline for submission:	December, 31, 2010
Notification of acceptance or rejection:	May, 1st, 2011
Deadline for receiving corrected version for revised versions:	July 1st, 2011
Final decision for revised papers:	October 1st, 2011

Instructions for submissions:

Your submission should be prepared by using the LaTeX style file of the International Journal of Foundations of Computer Science to be found at:
http://www.cs.ucsb.edu/ ijfcs/ and should not exceed 20 pages in this format, including figures, tables and pos- sible appendices. Your submission should not have been previously published, nor currently submitted elsewhere for publication. All submitted papers will be refereed in accordance with the usual criteria of IJFCS.