

Surjective Cellular Automata of neighborhood size at most 6

Emmanuel Jeandel

► **To cite this version:**

Emmanuel Jeandel. Surjective Cellular Automata of neighborhood size at most 6. Data files. 2017. <hal-01583896>

HAL Id: hal-01583896

<https://hal.inria.fr/hal-01583896>

Submitted on 8 Sep 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Surjective Cellular Automata of neighborhood size at most 6

Emmanuel Jeandel

Universit de Lorraine, CNRS, Inria, LORIA, F 54000 Nancy, France

September 8, 2017

Abstract

We enumerated all surjective cellular automata with neighborhood size at most 6 (radius at most 2.5)

Contents

As many surjective cellular automata are right or left permutive, we excluded these automata from the files.

The result are as follows:

- There are no surjective CA that is not permutive in neighborhood size 1,2,3
- There are 64 surjective CA that are not permutive in neighborhood size 4
- There are 11580 surjective CA that are not permutive in neighborhood size 5 (radius 2)
- There are 69926516 surjective CA that are not permutive in neighborhood size 6

Due to the way HAL works, it is not possible to put a binary file directly. To obtain the result, you should therefore

- Apply the command `base64 -d data.txt > data.tar.xz` to obtain a `tar.xz` file from the `txt` file. If you are on a Windows machine, the command is `certutil -decode data.txt data.tar.xz`
- Decompress the resulting file. Warning: The result is 600Mb long.

Contents can be extracted from the given files by the following command: `python ca.py N x` where `python` is Python2 (the program is not compatible with Python3), `N` is the neighborhood size, and `x` is the number of the automaton to display.