



SPLIT SUMMER SCHOOL STSS2018

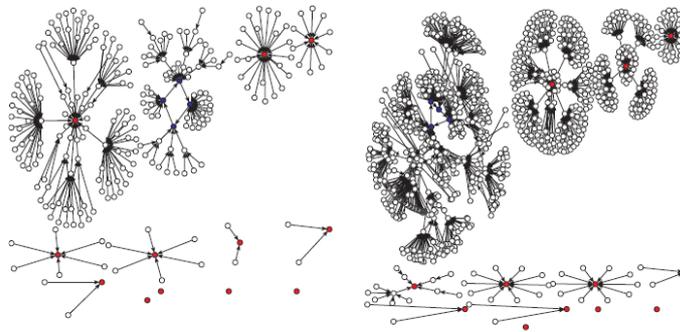
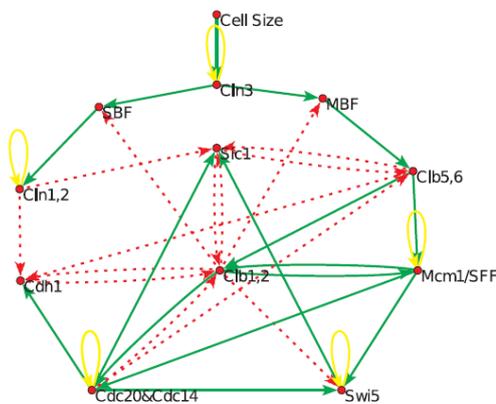
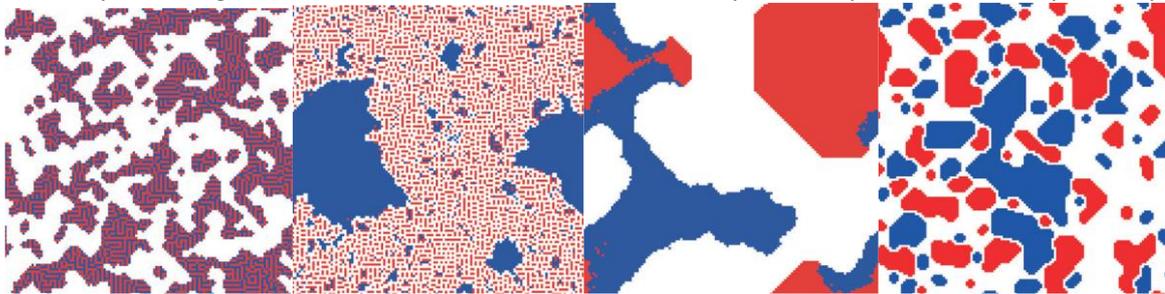
**COURSE: AUTOMATA NETWORKS AND APPLICATIONS**

Contact person: Professor Ivan Slapničar [ivan.slapnicar@fesb.hr](mailto:ivan.slapnicar@fesb.hr)  
Phone: +385 91 4305893

Web page: <http://www.unist.hr/split-summer-school-2018>

Main topics:

- the course will present recent results and applications related with automata networks
- an automata network consists of the dynamics driven in a finite (or finitely connected) graph, such that in every vertex there is a local transition rule depending on neighbors and values taken from a finite set of states
- considering the cellular automata, genetic regulation and Boolean networks, majority networks, Shelling and Sakoda models in social sciences and others
- presenting theoretical results as well as some developed examples (in Julia or Python) applied to previous cases



Program structure:

- 5-day course
- students will make their final presentations
- students will get lecture notes

**Important dates:**

Course dates: July 2 - 6, 2018  
Deadline for application: May 15, 2018  
Payment due by: June 1, 2018  
Confirmation of the course: June 10, 2018

Price of the course: 300 € (tax included)

**Bed & breakfast:** 189 € (tax included) – contact person: Marina Kero

[marina.kero@scst.hr](mailto:marina.kero@scst.hr)

## Programme plan:

### Day 1

- Introduction to automata networks: definitions of automata networks, one dimensional cellular automata, notations and examples (3h)
- Individual work/exercise (1h)

### Day 2

- Cellular automata, genetic regulation and Boolean networks: Boolean networks, some other networks, a study of two models related to cell cycle (3h)
- Individual work/exercise (1h)

### Day 3

- Majority networks, Shelling and Sakoda models in social sciences: majority networks and the bootstrap percolation model, threshold networks, dynamical results – the energy associated with the network, some results on the computational complexity (3h)
- Individual work/exercise (1h)

### Day 4

- Current examples of automata networks: one-dimensional prediction problems, two-dimensional freezing automata networks (3h)
- Individual work/exercise (1h)

### Day 5

- Students' final projects (3h)
- Final presentations (1h)

## Programme lecturers:

Professor Eric Goles Chacc

Facultad de Ingeniería y Ciencias  
Universidad Adolfo Ibanez, Santiago, Chile

Professor Ivan Slapničar

University of Split, Faculty of Electrical Engineering,  
Mechanical Engineering and Naval Architecture, Split  
Croatia