



8th ESSA / SiLiCo Summer School in Social Simulation “Agent-based modelling for resilience”

Local speakers

Arnold Bregt - Gert Jan Hofstede - Mark Kramer - Krijn Poppe - George van Voorn

Guest speakers

Giangiacoimo Bravo (Linnaeus University) - Guillaume Deffuant (Irstea) - Bruce Edmonds (Centre for Policy Analysis, Manchester Metropolitan) – Iris Lorscheid (Hamburg University of Technology) - Igor Nolic (TU Delft) - Gary Polhill (James Hutton Centre) - Maja Schlüter (Stockholm Resilience Centre)

26-30 June 2017

**Course organised by the Wageningen School of Social Sciences (WASS), and
Production Ecology & Resource Conservation
Wageningen University**

Introduction & objectives of the course

General introduction

Resilience of systems is a major research challenge for our world's future. The systems in which our societies operate have social, ecological and technical components that are ever more connected. Our ambitions for guiding these systems are growing. Agent-based modelling is one of the techniques for investigating the complex, often surprising behaviour of these systems, and their response to policy interventions.

The ESSA / SiLiCo summer school allows PhD students, researchers and practitioners to gain hands-on skills in agent-based modelling for resilience, guided by a cast of the most experienced researchers in the field.

Theme: resilience

Resilience is the capacity of a system to continue performing certain behaviour even when submitted to external pressure.

Systems that include people and their environment have a way of evolving autonomously; however, through management and policy we try to steer these systems towards delivering desired services. This holds for socio-ecological and socio-technical systems, for industrial networks, for tourism destinations, for food and health issues in society, etc.. What these systems all have in common is that they are complex adaptive systems: human behaviour and decision-making change the system over time, thus having a considerable effect on the resilience properties of these systems. Moreover, such effects tend to emerge from the many feedback mechanisms that exist between human actors and their environment. As a consequence, managers, policy makers or citizens cannot force these systems into resilient behaviour by decree. Instead, they first have to understand the dynamics of their behaviour. This includes the natural and technical aspects as well as the human side. This latter one could contain institutional, economic, sociological and psychological aspects. Without such an understanding of CAS, policies cannot be reasonably expected to improve the resilience of systems.

Technique: agent-based modelling

Agent-based modelling has proven to be capable of yielding insight in how the behaviour of actors and components of complex adaptive systems can result in non-linear, often unintended, patterns of system behaviour. Running an ABM with different initial settings provides clues to what patterns certain interventions or policies will result in. As such, an agent-based model is a living hypothesis of a system, and agent-based modelling provides a critical tool in the study of the resilience properties of complex, human-managed systems.

Formula

During one week, max 5 teams of approx. 6 participants will execute a full research cycle using agent-based modelling. This includes pinpointing a simplified research question of interest, creating a simulation in Netlogo, doing sensitivity analysis and elementary validation. The work will be facilitated by practical instruction, and there will be visionary talks by reputed speakers to place it in a wider context.

Objectives

- To understand how the method agent-based modelling can contribute to research on the resilience of complex socio-ecological-technical systems
- To be acquainted with the state of the art through invited speakers by leading experts
- To create an agent-based model using Netlogo
- To document one's own model using the ODD protocol
- To carry out verification and validation of one's own model

Target group

The summer school is primarily intended for PhD students and other young researchers from academia and R&D personnel from industry (including DLO). The course is open to all who are interested in the

theme, regardless of specialization. We actively seek cross-fertilization between research fields and between academia and industry. A maximum of 30 participants will be accepted. They will work in five 6-person teams. Each team will deliver a working agent-based model (ABM) simulation that tackles a specific research question regarding resilience.

Assumed prior knowledge

- Basic knowledge of research methodology
- At ease with computers; programming experience is not required but will make life easier
- Academic-level grasp of the English language

Course fees

Fees	early bird (register by April 1 2017)	late registration (register by June 1 2017)
SENSE/PE&RC/WASS PhD's with TSP	€ 300	€ 350
Other PhDs – WUR staff	€ 600	€ 675
external participants	€ 1000	€ 1100

Fees include course materials, drinks (during the day programme), lunches, a course dinner and accommodation (5 nights in a 2p bedroom in Hotel de Nieuwe Wereld).

Global programme

Sunday 25 June:

- Informal get-together

Monday 26 June: select case

- setting the scène (Krijn Poppe, Maja Schlüter, Igor Nikolic)
- teaming up
- teams select a case and research question around resilience
- small carrousel: each team informs the others
- social programme (tour around Wageningen, dinner in town)

Tuesday 27 June: conceptual model

- from research question to conceptual model; theory use (Gert Jan Hofstede, Arend Ligtenberg, Giangiacomo Bravo, Guillaume Deffuant)
- Netlogo tutorial (Mark Kramer)
- Teams develop first resilience concept and conceptual model

Wednesday 28 June: model implementation

- Documenting a model (Gary Polhill)
- Types of models; KIDS or complex (Bruce Edmonds)
- Teams works on further model development and operationalisation of resilience
- Social dinner

Thursday 29 June: model analysis and resilience concept operationalisation

- Model analysis and making your resilience concept operational (Iris Lorscheid, George van Voorn)
- Teams work on further model development and analysis, quantifying resilience
- Evening: teams work on presentations for Friday morning

Friday 30 June: outlook

- Teams present their work; trophy award by a selected jury
- Workshop 'what next' moderated by Arnold Bregt

Requirements and ECTS

1.5 credits (according to European Credit Transfer System).

Location

The Summer School will take place in Hotel de Nieuwe Wereld, Marijkeweg 5 in Wageningen, The Netherlands.

Registration

Registration is possible electronically via the WASS courses page:

<http://www.wageningenur.nl/en/Education-Programmes/PhD-Programme/Graduate-Schools/Wageningen-School-of-Social-Sciences/Courses/Registration.htm>

The maximum number of participants is set at 30, the minimum at 15. Participants will be selected based on their motivation and background.

To this end, please submit (using the upload button in the registration form) a résumé (maximum 1 A4) and a small proposal (maximum 1 A4) describing i) what you would like to learn during this summer school ii) how this links to the theme of resilience and iii) why you have chosen to register for this specific summer school.

Applicants that register before the early bird deadline will be notified late April 2017 whether they have been selected for participation in the summer school.

Please make sure that you provide the most recent contact details so that in case of any changes you will be notified promptly. After your internet registration you will receive a short notification that your name has been registered. At least two weeks before the course you will receive a second confirmation about the location and the schedule. WASS will also send an invoice to the address indicated in the registration form.

Please e-mail to Marcella.Haan@wur.nl in case you have not received the second confirmation two weeks before the course.

Scholarships

The Summer School organisation is able to offer scholarships covering the conference fee to some applicants from developing countries. Eligible candidates (who are from and currently based in formally recognized developing countries) may send their request and motivation to Marcella.Haan@wur.nl.

Cancellations

Cancellations may be made free of charge until 1 month before the start of the course. Cancellation fee of 100 % applies if participants cancel the course less than 1 month prior to the course. The organisers have a right to cancel the course not later than 1 month before the course starts. The participants will be notified of any changes at their e-mail addresses.

Further information

On course content please contact the local organizers: Gert Jan Hofstede (INF group), Arend Ligtenberg (Geo-Informatics), George van Voorn (Biometris). They can be reached through: essasummerschool@wur.nl.

For details about the logistics, accommodation, registration, fees, study materials, etc. please contact Marcella Haan
Tel +31 317 484126
Marcella.haan@wur.nl

Contact addresses:

Wageningen School of Social Sciences
 Wageningen University
 Hollandseweg 1
 6706 KN WAGENINGEN
 The Netherlands

From Schiphol Amsterdam Airport to Wageningen

At the Airport you can buy a train ticket in the 'arrivals' area by the baggage claims. You will see the sign "Train tickets" near the exit. Then follow the signs 'Nederlandse Spoorwegen' (NS) or 'Trains and busses' to the railway station.

Purchase a one-way ticket to the Ede-Wageningen train station, this will cost € 14,10 (plus a service charge if you buy the ticket at the ticket counter). It is also possible to buy the ticket from the ticket vending machines in the station.

There are direct connections from Schiphol Amsterdam Airport to Ede-Wageningen every 30 minutes. Additionally, twice an hour there is a connecting service from Schiphol to Ede-Wageningen where you have to change trains in Utrecht. The destination boards on the platform will indicate the different stations where the train will stop. Check for the names Ede-Wageningen or Utrecht and board the train and when necessary change in Utrecht. The trip from Schiphol to Ede-Wageningen takes you a bit more than one hour.

For Dutch train connections use www.ns.nl, www.thalys.com, www.db.de



The train station is not located directly in Wageningen. This lack is fully compensated by fair means of transportation by buses and taxis. From railway station Ede-Wageningen you can take a taxi (approx.15 min.). Taxis leave at the north side of the station. You can also come by bus: line 52 (direction

Wageningen/ Arnhem) departs from the north side of the station or bus line 88 (Valleilijn, direction Wageningen) leaves from the south side of the station. You have to purchase a ticket from the driver in the bus, which will cost about 2 euros.