



## Call 2019

# Summer School on Computational Methods and Agent Based Modelling in Economics

Organised as part of

**Advances in Economic Dynamics and  
Development: Economics and Complexity**

Sixth Edition - 2019

Dec 02<sup>th</sup> to 06<sup>th</sup>, 2019

Curitiba – Brazil

Organised by



Nucleo of Economics & Complexity



UNIVERSITY  
OF SUSSEX

BUSINESS  
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Graduate Program in  
Economic Development  
1989-2017



## Aims and Objectives

Agent-based simulation models are becoming an essential tool in economics and other social sciences to study complex systems at different levels of aggregation.

Along with these opportunities come the challenges related to programming, abiding to a robust protocol and properly communicating the model and results.

**This course will provide students with the necessary skills to design, implement, and analyze robust agent based models.**

This week-long full-time intensive course will provide PhD students and young researchers with the technical and methodological skills required to successfully develop and analyze simulation models in a research project, such as a PhD or a paper.

## What you will learn

The course will alternate lectures, exercises carried out by the students under the supervision of the teaching staff, group discussion and individual supervision. The course provides guidance on all the steps a researcher needs to follow to design and use an agent-based simulation model. Students will be encouraged to work on their own research project and develop an original simulation model.

Participants will learn how to build economic models using the simulation platform Laboratory for Simulation and Development – LSD:

[www.labsimdev.org](http://www.labsimdev.org) and  
<https://github.com/marcov64/Lsd>.

## To whom it is addressed

The summer school is addressed to highly motivated **graduate and PhD students** as well as researchers and experienced modellers interested in computational social sciences.

## Workshop on Economic Complexity and Development 10-11<sup>th</sup> Dec

Economic development is a complex phenomenon, involving heterogeneous agents, continuous innovations and structural changes. Understanding the unbalances and discontinuities in the process of economic development requires tools and thinking suited to deal with complex systems.

Beyond the course, students also will have an opportunity to attend the **Workshop on Economic**

**Complexity and Development** taking place in Curitiba from 9-10 December 2019 (no registration fees required).

## Teaching staff

- Prof. Marco Valente (University of L'Aquila)
- Dr. Tommaso Ciarli (University of Sussex)
- Prof. João Basilio Pereima (UFPR)
- Prof. Marcelo Pereira (UNICAMP)
- Dr. Francisco Gabardo (UFPR)

## Application Procedure

Application deadline is **25-October 2019**.

Candidates should upload PDF files in English contenting the following parts:

- **CV**,
- **Motivation letter** (max 2 pages)
- Where available, a **short project** describing the model they would be interested in developing (max 2 page),
- **Motivation letter for funding**, where needed.

Applicants should fill the on-line form and upload relevant material at the following link:

<https://goo.gl/forms/TeMy6ZMQ1G8ZzLw2>

Selection process will be disclosed **until 01-November**.

## Participation Fee and Travel Support

Participation in the summer school is free of charge. The number of participants is restricted to 20.

## Travel Assistance for Foreign Students

Financial assistance for travel expenses of up to US\$ 100,00 (domestic) or US\$ 300,00 (international) from INET-TSI is available. **Assistance is limited** and interested students should apply for it when filling in the above form.

## Local expenses

All students are responsible for local expenses, such as lunches, dinners and accommodation. The local organisers will provide subsidized lunch and dinner (US\$ 1,45 each) in the canteen and coffee breaks. Vegetarian and vegan food are available.

## Contact

**Coordination** - Prof. João Basilio Pereima  
55(41) 98492-4117 [joaobasilio@ufpr.br](mailto:joaobasilio@ufpr.br)

**PPGDE Secretariat** - Andréa Silva  
55(41) 3360-4405 [ppgde@ufpr.br](mailto:ppgde@ufpr.br)

**Academic Support** - Francisco Gabardo  
55(41)99960-6503 [gabardo.francisco@gmail.com](mailto:gabardo.francisco@gmail.com)

## Advances in Economic Dynamics and Development: Economics and Complexity - 6<sup>th</sup> Meeting 2019

### Summer School on Computational Methods and Agent Based Modelling in Economics

#### Preliminary Schedule - subject to change

December 02<sup>th</sup> to 06<sup>th</sup>, 2019

	Mon 02/12	Tue 03/12	Wed 04/12	Thu 05/12	Frid 06/12
<b>Time</b>	<b>Morning - 09:00 to 13:00</b>				
<b>09:00</b>	<b>Welcome and Briefing</b>	<b>Introduction to LSD basic grammar and structure</b>	<b>Brian Arthur model</b>	<b>From model design to validation</b>	<b>Sensitivity analysis in LSD and R</b>
<b>10:00</b>	<b>Lecture</b> Introduction to Complexity and Agent-Based Modelling	Using LSD to study a simple function with complex properties	Bringing all together	Work in groups or alone in building an assigned mode	
<b>11:00</b>	Break	Break	Break	Break	Break
<b>11:30</b>	<b>Lecture</b> Introduction to LSD: setup, language and programing.	<b>My first model in LSD</b> Replicator dynamics, the use of objects, and errors debugging	<b>Lecture</b> Scientific simulations in social sciences: a methodological discussion	<b>Implementation of an exercise</b> Work in groups in building an assigned model	<b>Implementation of an exercise</b> Work in groups in building an assigned model, and preapre presentation
<b>13:00</b>	Lunch	Lunch	Lunch	Lunch	Lunch
	<b>Afternoon - 14:00 to 18:00</b>				
<b>14:00</b>	<b>Student presentations</b> bio, research interests, research topic (5 mins each)	<b>Individual discussion</b> Each student will be assigned a tutor	<b>Individual discussion</b> Each student will be assigned a tutor	<b>Individual discussion</b> Each student will be assigned a tutor	<b>Individual discussion</b> Each student will be assigned a tutor
<b>14:30</b>		<b>Group discussion</b> Group discussion on students' research project in smaller thematic groups	<b>Workgroup</b> Group discussion on students' research project in smaller thematic groups	<b>Workgroup</b> Group discussion on students' research project in smaller thematic groups	<b>Workgroup</b> Group discussion on students' research project in smaller thematic groups
<b>15:00</b>	<b>Introduction to LSD basic grammar and structure: Simple model exercises</b>	<b>LSD code and object structure</b> Random walk: playing with objects and pseudo randomness. Extending an existing model	<b>My first advanced model in LSD</b> Smallwood and Conslisk consumer model	<b>Implementation of an exercise</b> Work in groups in building assigned model	<b>Students' assignment presentations</b>
<b>17:00</b>	Break	Break	Break	Break	Break
<b>17:30</b>	<b>Group work on exercises</b>	<b>Group work on exercises</b>	<b>Group work on exercises</b>	<b>Group work on exercises</b> validation techniques	<b>Closing session</b> End of Summer School
<b>18:30</b>	End of workday	End of workday	End of workday	End of workday	

**Workgroups:** During the **Workgroup** sessions, students will discuss their research projects with the teaching staff. These sessions will be aimed at helping students to improve their research projects and preparing them for publication. Students should send the final version of their projects to [gabardo.francisco@gmail.com](mailto:gabardo.francisco@gmail.com) until 25/11/2019.



**Marco Valente  
(L'Aquila - Italy)**

Associate Professor in Economics, Department of Industrial and Information Engineering and Economics, University of L'Aquila and visiting fellow at the University of Sussex, Science Policy Research Unit

(SPRU). **Research area:** Complexity, networks, demand and industrial dynamics, simulation modelling, methodology of simulations in social sciences; evolutionary economics.



**João Basilio Pereira  
(UFPR, NeX - Brazil)**

Professor of Economics at the Department of Economics, Federal University of Paraná (UFPR). Coordinator of NeX-Núcleo of Economics and Complexity.

**Research area:** Complexity, agent-based economics, computational economics, growth and development, structural change, evolutionary economics, micro-macro economics.



**Tommaso Ciarli  
(Sussex - UK)**

Senior research fellow at SPRU, University of Sussex.

**Research area:** economic development, micro-macro models, technological change, growth, and the effects of conflicts.



**Francisco Gabardo  
(UFPR, NeX- Brazil)**

Pos-Doctorate researcher at the Graduate Program in Economic Development (PPGDE), Federal University of Paraná (UFPR).

Researcher at NeX-Núcleo of Economics and Complexity. **Research area:** Complexity, agent-based economics, computational economics, growth and development, structural change, evolutionary economics, micro-macro economics.



**Marcelo de Carvalho Pereira  
(Unicamp - Brazil)**

Professor in Economics at the Institute of Economics, State University of Campinas (UNICAMP).

**Research area:** Industrial Organization, Institutional Theory, Evolutionary Economics, Social Network and Simulation Models.