



# PhD in DATA ANALYTICS AND DECISION SCIENCES - 37th cycle

## THEMATIC Research Field: SOCIO-ECONOMIC IMPACT OF COVID-19

### Monthly net income of PhDscholarship (max 36 months)

**€ 1300.0**

In case of a change of the welfare rates during the three-year period, the amount could be modified.

### Context of the research activity

#### Motivation and objectives of the research in this field

Covid-19 creates enormous consequences for the social-economic systems of many countries, both for the direct impact on health systems and for non-pharmacological measures to prevent the spreading of infections. The objective of this research is to study the impact of socio-economic policies during COVID-19. The research will take advantage of collaboration with Banca D'Italia (group of Dr. L. Bellomarini department of Informatics) and of with Technical University Wien (group of Prof. G. Gottlob and Prof. E. Sallinger). As preliminary work, by using Facebook mobility data and ISTAT socio-economic variables, we discussed the different effects of lockdown measures on Italian regions.

#### Methods and techniques that will be developed and used to carry out the research

For modelling COVID-19 knowledge we will use knowledge graphs and logic languages. In particular, we will use Vadalog, an extension of Datalog with higher expressive power. We will take advantage of big data, representing real-time data mobility (from Facebook), micro and macro-economic variables and ownership networks to develop models of the social-economic systems, with instability and transitions. We will also use a complex network approach based on network topology, as well as classic algorithms for knowledge inference using artificial intelligence.

#### Educational objectives

The candidate will learn how to apply efficient analysis algorithms to complex socio-economic systems; learn



	next generation languages for developing complex mathematical and statistical systems; process big datasets and apply to them methods of machine learning for classification and prediction.
<b>Job opportunities</b>	The job market is eager of employing doctors with this background. More than 15 recent doctors of the proposing groups were immediately employed in companies and research centers, with very competitive salaries.
<b>Composition of the research group</b>	2 Full Professors 2 Associated Professors 3 Assistant Professors 10 PhD Students
<b>Name of the research directors</b>	Stefano Ceri

<b>Contacts</b>
<p>Stefano Ceri, Fabio Pamolli, Luigi Bellomarini</p> <p><a href="https://en.wikipedia.org/wiki/Stefano_Ceri">https://en.wikipedia.org/wiki/Stefano_Ceri</a>  <a href="mailto:stefano.ceri@polimi.it">stefano.ceri@polimi.it</a>  335-1229621</p> <ul style="list-style-type: none"> <li>• <a href="http://datascience.deib.polimi.it/">http://datascience.deib.polimi.it/</a></li> <li>• <a href="http://www.bioinformatics.deib.polimi.it/geco/?home">http://www.bioinformatics.deib.polimi.it/geco/?home</a></li> </ul>

<b>Additional support - Financial aid per PhD student per year (gross amount)</b>	
<b>Housing - Foreign Students</b>	--
<b>Housing - Out-of-town residents (more than 80Km out of Milano)</b>	--

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	566.36 €
<b>By number of months</b>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
<p>List of Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research:</p> <ul style="list-style-type: none"> <li>• Banca d'Italia</li> <li>• TU Wien</li> </ul>



- Oxford University
- Harvard University
- Center for Urban Science and Progress, NYU

There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.