



UNIVERSITÀ DEGLI STUDI  
DI TRENTO

Dipartimento di Matematica



# SEMINARI

**Thursday 9 April 2020 – at 4.00 p.m.**

The event will take place online through the ZOOM platform.  
To attend the event, use the following link and access codes:

<https://zoom.us/j/249986719?pwd=RTBjbXVmbUN4c1RETCTaOW5zTVlzd09>

**Meeting ID: 249 986 719 - Password: 019142**

## **Giulia Giordano**

(Department of Industrial Engineering, University of Trento)

### **A new epidemiological model to understand and predict the COVID-19 outbreak: the Italian case**

#### **Abstract:**

In late December 2019, a novel strain of Coronavirus (SARS-CoV-2) causing a severe, potentially fatal respiratory syndrome (COVID-19) was identified in Wuhan, Hubei Province, China and is causing outbreaks in multiple world countries, soon becoming a pandemic. On March 31, 2020, the Italian Civil Protection documented a total of 105792 confirmed cases and 12428 deaths of people tested positive for SARS-CoV-2. In the context of an infectious disease outbreak, it is of paramount importance to predict the trend of the epidemic in order to plan an effective control strategy and to determine its impact. We propose a new epidemic model that discriminates between infected individuals depending on whether they have been diagnosed and on the severity of their symptoms. The distinction between diagnosed and non-diagnosed is important because non-diagnosed individuals are more likely to spread the infection than diagnosed ones, since the latter are typically isolated, and can explain misperceptions of the case fatality rate and of the seriousness of the epidemic phenomenon. Being able to predict the amount of patients that will develop life-threatening symptoms is important since the disease frequently requires hospitalization (and even Intensive Care Unit admission) and challenges the healthcare system capacity. We show how the basic reproduction number can be redefined in the new framework, thus capturing the potential for epidemic containment. Simulation results are compared with real data on the COVID-19 epidemic in Italy, to show the validity of the model and compare different possible predicted scenarios depending on the adopted countermeasures.

Giulia Giordano is a researcher at the Department of Industrial Engineering and her main research interests include the study of dynamical networks, the analysis of biological systems and the control of networked systems. <http://giordanogiulia.altervista.org/>

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#### **CONTATTI**

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