

A G20 Heads of State and Government event

# Artificial Intelligence and Robotics in the perspective of social challenges

July 28th, 2021 from 9:30 GMT+2

Leonardo Room, Istituto Italiano di Tecnologia (CCT)

Via Morego 30, Genova

Live streaming available

<https://short.iit.it/g20iit>



## Scientific Programme

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# Scientific Programme

9:30

Giorgio Metta

Istituto Italiano di Tecnologia

Opening: Artificial Intelligence and Robotics in the perspective of social challenges

9:45

Michele Parrinello

IIT - Istituto Italiano di Tecnologia

Artificial Intelligence meets Atomistic Simulations

One of the pillars of modern science is computer simulation based on an atomistic description of matter. Simulations help in interpreting experiments, thus providing precious insight. In addition, simulations can replace costly experiments and can be thought of as a form of virtual microscopy. Simulations have proved to be of invaluable help in addressing some pressing problems like health, environment and energy. They are used to discover new drugs, design new materials for energy, and develop greener and more energy-efficient chemical processes. We describe here how machine learning techniques have further enhanced the scope of simulations, leading to a more efficient and accurate modeling that is capable of accelerating the pace of scientific discovery.

10:30

Cecilia Laschi

NUS - National University of Singapore

Robotics and the embodied side of intelligence

Recent progresses of AI offer unique opportunities for providing robots with intelligence. At the same time, robotics can provide physical bodies to intelligence. Robotics and AI are depicting a vision for intelligent machines where embodied forms of intelligence promote the development of smart behaviours, in real-world scenarios. Rethinking robot bodyware contributes to this vision and enables a wider adoption of intelligent machines. A mindful allocation of roles between humans and robots can materialise an acceptable, sustainable, and beneficial human-machine coexistence.

11:15 Break

11:30

Rita Cucchiara

UNIMORE - Università degli Studi di Modena e Reggio Emilia

## Artificial Intelligence for People and about People

Computer vision is one of the most successful stories in the modern AI journey, empowered by deep learning, data availability, and GPU-based supercomputers. For more than two decades, research has devoted a great effort into automatically understanding humans from visual data. The scientific results have been the foundation of impressive applications ranging from video surveillance, biometrics, human-robot interaction, natural interfaces, media retrieval, entertainment and edutainment to medicine for human rehabilitation. They may also involve potential risks, both at the design level due to data bias and model uncertainty, and at the usage-level due to possible ethical implications, also highlighted by the recent “Artificial Intelligence Act” of the European Commission. Many challenges remain to be solved, in terms of robustness, accuracy and sustainability of solutions and in terms of compliance with human-centric AI paradigms, challenges that are now being addressed chorally by the entire international research community.

12:15 Lunch break

13:30

Bernhard Schoelkopf

Max Planck Institute

## Symbolic, statistical and causal AI

The talk will discuss the relationship between statistical and causal learning, and some thoughts on how to address shortcomings of statistical learning by taking into account causal structures. It will also discuss the problem of ‘disentanglement’ from the causal point of view.

14:15

Tomaso Poggio

McGovern Institute - M.I.T.

## The Science and Engineering of Intelligence

In recent years, artificial intelligence researchers have built impressive systems. Two of my former postdocs — Demis Hassabis and Amnon Shashua — are behind two main recent success stories of AI: AlphaGo and Mobileye, based on two key algorithms, both originally suggested by discoveries in neuroscience: deep learning and reinforcement learning. To create artifacts that are as intelligent as we are, we need several additional breakthroughs. I will describe why a good bet is that several of them will come from interdisciplinary research between the natural

science and the engineering of Intelligence. This vision is in fact at the core of the CBMM research program, of which I will outline organization and research strategy, including the importance of ethics and of its neural bases. I will conclude asking where are we in the science and engineering of intelligence and where is AI going to go. I will also discuss how we could possibly find out which kind of neural circuits are responsible for uniquely human forms of intelligence.

15:00

Michael I. Jordan (video conference)

University of California, Berkeley

### On the Blending of Machine Learning and Economics

Statistical decisions are often given meaning in the context of other decisions, particularly when there are scarce resources to be shared. Managing such sharing is one of the classical goals of microeconomics, and it is given new relevance in the modern setting of large, human-focused datasets, and in data-analytic contexts such as classifiers and recommendation systems. I'll discuss several recent projects that aim to explore the interface between machine learning and microeconomics, including the study of exploration-exploitation tradeoffs for bandits that compete over a scarce resource, the use of Langevin-based algorithms for Thompson sampling, leader/follower dynamics in strategic classification, and the robust learning of optimal auctions.

15:45

Final remarks

*Please note that, due to COVID-19 restrictions, the Leonardo Room capacity has been reduced and only a limited number of in-person attendees is possible.*

*You can reserve your seat here following this link: [seat reservation](#).*

