The Future of Scientific Discovery

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Biography:

Dr. Alessandro Curioni is an IBM Fellow, Vice president of Europe and director of the IBM Research lab in Zurich, Switzerland. In addition to leading the IBM Research activities in Europe, he is also responsible for the global research in IoT and Security.

Dr. Curioni is a world recognized leader in the area of high performance computing and computational science where his innovative thinking and seminal contributions have helped solve some of the most complex scientific and technological problems in healthcare, aerospace, consumer goods and electronics. He was a member of the winning team recognized with the prestigious Gordon Bell Prize in 2013 and 2015.

Dr. Curioni received his undergraduate degree in Theoretical Chemistry and his PhD from Scuola Normale Superiore, Pisa, Italy. He started at IBM Research - Zurich as a PhD student in 1993 before officially joining as a research staff member in 1998. His most recent position has been the head of the Cognitive Computing and Computational Sciences department.
In 2017 he was named a member of the Swiss Academy of Engineering Sciences.

Abstract:

The development of new materials or the improvement of existing industrial processes requires digesting and evaluating large amounts of data collected from an extensive number of publications, internal and external reports as well as proprietary data. The analysis of this vast body of dormant "dark" data generates knowledge that has rarely been mined to solve problems in other contexts. Until now.

Artificial Intelligence (AI) aims to automate the extraction of the knowledge from these dark sources, including the reasoning related to this knowledge, and to store this rich body of knowledge for application to future scientific or technological questions.

This approach constitutes a new way of doing scientific discovery because we exploit the dormant knowledge accumulated over years to arrive more quickly and accurately at a solution to the issue at hand. More specifically, we can use AI learning models to mine the data and to predict new materials or improve existing processes in a manner that formerly only the human brain could perform.

I will discuss the remarkable progress of AI in this field and give a glimpse of what the future may look like.