Associazione Italiana per l'Intelligenza Artificiale

# Spotlight Seminars on AI

Spring 2022

## Machine Learning and Logic: Fast and Slow Thinking

Moshe Y. Vardi - *Rice University*

https://www.youtube.com/c/AIxIAit *live streaming, Q&A, and replay*

**June 24 - 5:00 PM (CEST)**

Computer science seems to be undergoing a paradigm shift. Much of earlier research was conducted in the framework of well-understood formal models. In contrast, some of the hottest trends today shun formal models and rely on massive data sets and machine learning. A canonical example of this change is the shift in AI from logic programming to deep learning.
I will argue that the correct metaphor for this development is not paradigm shift, but paradigm expansion. Just as General Relativity augments Newtonian Mechanics, rather than replace it — we went to the moon, after all, using Newtonian Mechanics — data-driven computing augments model-driven computing. In the context of Artificial Intelligence, machine learning and logic correspond to the two modes of human thinking: fast thinking and slow thinking.
The challenge today is to integrate the model-driven and data-driven paradigms. I will describe one approach to such an integration, making logic more quantitative.

**Moshe Y. Vardi** is Karen Ostrum George Distinguished Service Professor in Computational Engineering at Rice University, where he is leading an Initiative on Technology, Culture, and Society. His interests focus on automated reasoning, a branch of Artificial Intelligence with broad applications to computer science, including machine learning, database theory, computational-complexity theory, knowledge in multi-agent systems, computer-aided verification, and teaching logic across the curriculum. He is also a Faculty Scholar at the Baker Institute for Public Policy at Rice University.