Avviso Seminario

Dipartimento di Matematica e Applicazioni "Renato Caccioppoli"
Università degli Studi di Napoli "Federico II"

Martedì 28 maggio 2024 Aula D ore 16:00

Jose Iovino

University of Texas at San Antonio

"Model theory, dynamics, and deep learning"

Abstract: In 2019, Bai, Kolter and Koltun introduced the concept of "Deep Equilibrium Model" for neural networks. They observed that, as the number of layers of a neural network grows, a point of "deep equilibrium" is reached, where the network can be effectively replaced by a simpler network that has a single layer that is "infinitely deep". They reported that this results in vast reductions in memory consumption (up to 88% in experiments). They also observed that, in many important cases, the deep equilibrium state is effectively computable.
We will discuss a mathematically formal proof of the existence of deep equilibrium models as well as a characterization of their effective computability. Our approach combines ideas of model theory and topological dynamics. Of central import are the concept of "type" from logic and the concept of type definability from model theory. However, we do not suppose previous experience in topological dynamics, or Ramsey theory, or logic. The talk is aimed at a general audience.

La Proponente
Giuseppina Terzo