数学与系统科学研究院

计算数学所学术报告

报告人：　**Prof. Hailiang Liu**

（ *Iowa State University, USA* ）

报告题目：

Selection dynamics for deep neural networks

邀请人：　龚伟 副研究员

报告时间：**2019** 年 **7** 月 **12** 日（周五）

上午 **10:00-11:00**

报告地点：　数学院南楼二层

202 教室

Abstract:

Deep learning is machine learning using neural networks with many hidden layers, and it has become a primary tool in a wide variety of practical learning tasks, such as image classification, speech recognition, driverless cars, or game intelligence. This work introduces the mathematical formulation of deep residual neural networks as a PDE optimal control problem. We study the wellposedness, the large time solution behavior, and the characterization of the steady states for the forward problem. We state and prove optimality conditions for the inverse deep learning problem, using the Hamilton-Jacobi-Bellmann equation and the Pontryagin maximum principle. This serves to establish a mathematical foundation for investigating the algorithmic and theoretical connections between optimal control and deep learning.

欢迎大家参加！