學　術　演　講

Sample Complexity of Kernel Methods for Machine Learning

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Abstract

In this talk, I will discuss the theoretical analysis of the sample complexity of kernel methods in machine learning, with applications to manifold learning and reinforcement learning. In manifold learning, we introduce scalable landmark-based spectral algorithms, Landmark Alternating Diffusion (LAD) and Landmark Vector Diffusion Maps (LA-VDM), designed for sensor fusion and for capturing complex geometric structures, respectively. Under standard manifold assumptions, we present theoretical guarantees on consistency, convergence, and finite-sample error. In reinforcement learning, we analyze kernel-based Q-learning and derive finite-sample complexity bounds for learning an ϵ-optimal policy in large state–action spaces, where the efficiency is characterized by the kernel's information gain. Together, these results provide a sample-complexity perspective on kernel methods across different learning settings, with brief remarks on related work in topological data analysis and signal processing.

日　期:114 年 12 月 24 日(星期三) 16:10~17:00

地　點:本校數學館 312 教室(嘉義縣民雄鄉大學路 168 號)

茶　會：15:30~16:00 數學館三樓 305 室舉行

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