数学与系统科学研究院

计算数学所网络学术报告

报告人： 印卧涛 教授

（ 阿里巴巴达摩院、加州大学洛杉矶分校 ）

报告题目：

Two Derivative-Free Algorithms Accelerated by Exploring Gradient Compressibility

邀请人： 刘歆 研究员

报告时间：2020 年 11 月 20 日（周五）晚上 19:35-20:10

报告工具：腾讯会议（**ID：521 3538 2330**）

会议密码：**311311**

Abstract:

We consider minimizing a high-dimensional objective function using

only evaluations of the function or even only comparing the function evaluations without knowing their actual values. Such optimization is also called derivative-free, zeroth-order, or black-box optimization. We propose two new methods called ZORO (using a zeroth-order oracle) and SCOBO (using a comparison-based oracle). When the underlying gradient is approximately sparse, ZORO and SCOBO need very few evaluations to obtain a new iterate that decreases the objective function. We achieve this with an adaptive, randomized gradient estimator, followed by an inexact (proximal) gradient scheme. Numerical experiments show that ZORO and SCOBO outperform the existing methods with similar settings on synthetic and real datasets, even when the gradients do not immediately appear to be approximately sparse. This is joint with Hanqin Cai, Daniel McKenzie, and Zhenliang Zhang.

报告人简介：

印卧涛博士从 **UCLA** 数学系教授，**2019** 年加入达摩院机器智能技术-决策智能实验室。印教授在分布式计算、优化算法、机器学习、图像处理的理论和应用方面取得系统性的创新成果。曾获 **Sloan** 研究奖和晨星应用数学金奖，世界 **1%**高引学者。

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