

PATT Position in APPLIED MATHEMATICS

Talks via zoom link:

Thursday, 28 January 2021

Sujet : PATT position in APPLIED MATH - presentation

Heure : 28 janv. 2021 09:45 AM Zurich

Participer à la réunion Zoom

<https://epfl.zoom.us/j/86059374376>

14:00 - 15:00

Dr Nikita ZHIVOTOVSKIY - Google Research, Zürich, CH

Title: Quantization of probability distributions under minimal moment assumptions.

Abstract:

In this talk we discuss the problem of quantization of a probability distribution, sometimes referred to as the k-means clustering problem, where based on n independent observations sampled according to the underlying distribution, one is aiming to find k centers minimizing the distortion. We only assume the existence of the two moments of the underlying distribution and work in general separable Hilbert spaces. Since we consider potentially heavy-tailed distributions, our estimation methods should be robust to the presence of outliers in the set of observations. We begin our talk with a short survey of the field. In the context of k-means clustering, we present the median of means based estimators together with corresponding non-asymptotic distortion bounds. Our results extend the renowned asymptotic result of David Pollard who showed that the existence of two moments is necessary and sufficient for strong consistency of an empirically optimal quantizer in \mathbb{R}^d . In a special case of clustering in \mathbb{R}^d , under two bounded moments, we show matching non-asymptotic upper and lower bounds on the distortion, which depend on the probability mass of the lightest cluster of an optimal quantizer.