GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN

Lecture series

on

Statistical aspects of the barycenter problem in metric spaces
With a focus on the space of probability measures

by

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November 25 and 28, 2019
10.15 am-11.45 am and 2.15 pm-3.45 pm

Venue: Institute for Mathematical Stochastics, Goldschmidtstr. 7, **SR 5.101**

Contents

Lecture 1: Introduction (Nov. 25, 10.15 am)

Lecture 2: **Optimal transport and the 2-Wasserstein space** (Nov. 25, 2.15 pm)

Lecture 3: **Ideas from metric geometry** (Nov. 28, 10.15 am)

Lecture 4: **Rates of convergence for empirical barycenters** (Nov. 28, 2.15 pm)

Abstract

In these lectures we will present finite sample guarantees for the estimation of barycenters (Fréchet means) in general geodesic metric spaces with lower bounded curvature (in the sense of Alexandrov) with the 2-Wasserstein space over $\mathbb{R}^d$ as a central example.
The theory of optimal transport, and especially the 2-Wasserstein space, has recently attracted a lot of attention from the statistical and machine learning community due to its specific geometrical features. Many questions of statistical nature remain largely open in the context of the Wasserstein space and the course will provide an introduction to the field along with an overview of some existing results and open questions.
The talks will assume no background in neither geometry nor optimal transport and will cover most of the necessary preliminary material for understanding the statements and proofs of the results.

The principal investigators of RTG 2088 invite you to participate.