PIMS-UBC Mathematics Lecture Series:

MARCO CUTURI (Université Paris-Saclay)

GENERATIVE MODELS AND OPTIMAL TRANSPORT

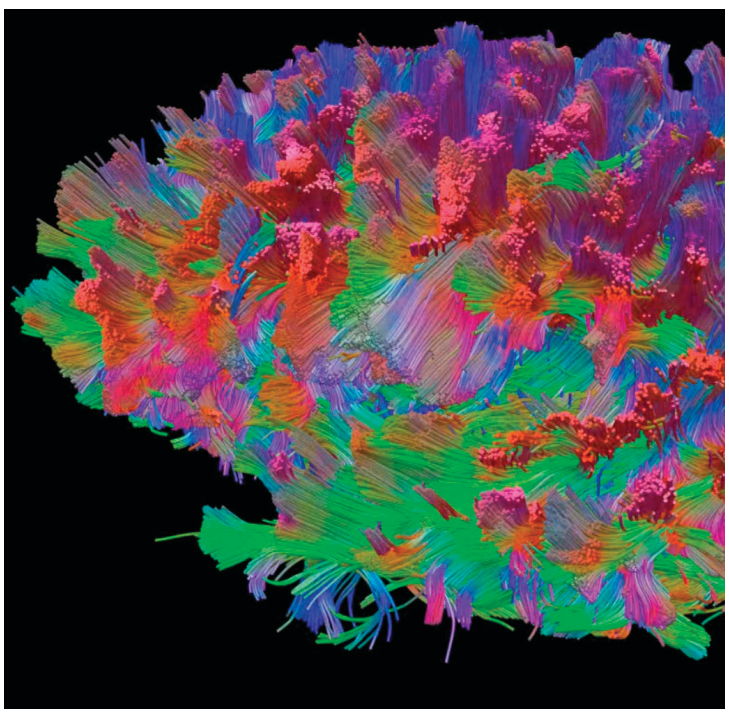
November 29, 2017 5:00pm | ESB 2012 (Opening reception: 4:30pm | ESB 4133)

A recent wave of contributions in machine learning center on the concept of generative models for extremely complex data such as natural images. These approaches provide principled ways to use deep network architectures, large datasets and automatic differentiation to come up with algorithms that are able to synthesize realistic images. We will present in this talk how optimal transport is gradually establishing itself as a valuable tool to carry out this estimation procedure.

REGULARIZED OPTIMAL TRANSPORT

PART I: November 30, 2017 5:00pm | ESB 2012

PART II: December 1, 2017 5:00pm | ESB 2012

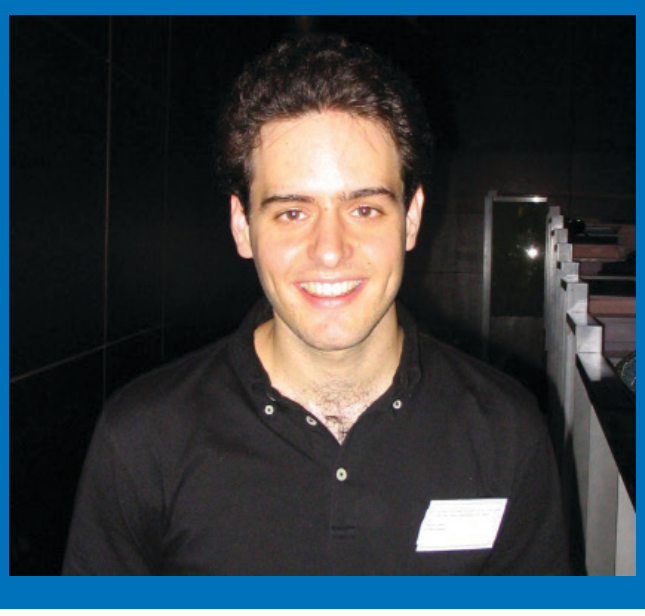


Optimal transport theory provides practitioners from statistics, imaging, graphics or machine learning with a very powerful toolbox to compare probability measures. These tools translate however in their original form into computational schemes that can become intractable or suffer from instability (such as non-differentiability or estimation bias). We will present in these two lectures how a few insights from optimization theory and in particular a careful regularization can result in tools that are considerably easier to implement, run faster because they can take advantage of parallel hardware and behave better from a statistical perspective. We will highlight applications from diverse areas, from graphics and brain imaging to text analysis and parametric estimation.

Marco Cuturi

Université Paris-Saclay

Marco Cuturi is a leading researcher in optimal transport and its applications to machine learning and related areas. One of his recent results, so-called 'entropy regularized optimal transport' has opened a way to practically solve optimal transport in challenging settings such as when dealing with high dimensional data, enabling the application of OT theory to machine learning and other problems in data sciences.



For more details visit: http://www.pims.math.ca/scientific-event/171129-pumdcmc

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