COMPUTATIONAL OPTIMAL MASS TRANSPORT.

ADVISOR: JÉRÔME BERTRAND & FRÉDÉRIC DE GOURNAY & AUDE RONDEPIERRE
INSTITUT DE MATHÉMATIQUES DE TOULOUSE

The purpose of this internship is to study an optimisation problem involving two measures over Euclidean space. In the classical setting, the total mass of the measures is the same and this problem is then called optimal mass transport (or just OT). More recently, an unbalanced version of OT appeared where the total mass can be different. This generalisation is promising for applications. The aim of the internship is to study theoretical and numerical aspects of OT (existence and properties of the solution, convergence of approximate solutions to the actual one, stability, rate of convergence). The main source for this internship is a book by Cuturi and Peyré together with related codes. Only a partial study of this book is expected (say Chapter 1 to 4 or 5) before specializing, if time permits, to a more limited subject, possibly unbalanced OT (several options are available).

Prerequisites:

Notions on optimal mass transport can save time but are not compulsory to complete the internship.

References:

- M. Cuturi, G, Peyré Computational Optimal Transport, https://arxiv.org/pdf/1803.00567
- https://optimaltransport.github.io/

Location & duration: IMT, 4 months.

Email address: bertrand@math.univ-toulouse.fr , degourna@insa-toulouse.fr, aude.rondepierre@insa-toulouse.fr