

# Master School on Data Science and Geometry

INSTITUT DE MATHEMATIQUES DE TOULOUSE

2-26 july 2019

Fourth week PROGRAM 22-26 july

	Monday	Tuesday	Wednesday	Thursday	Friday
9h00-10h30 room	<b>Lecture Risser</b> MIP	<b>Lecture Risser</b> MIP	<b>Lecture Chhaibi</b> MIP	<b>Lecture Chhaibi</b> MIP(9h00-10h45)	<b>Lecture Chhaibi</b> MIP(9h00-10h45)
11h00-12h30 room	<b>Lecture Risser</b> MIP	<b>Lecture Risser</b> MIP	<b>Lecture Chhaibi</b> MIP	<b>Lecture Chhaibi</b> MIP	<b>Lecture Chhaibi</b> MIP(11h00-12h00)
14h00-15h30 room	<b>Lecture Chhaibi</b> MIP		<b>Lecture Risser</b> MIP		
16h00-17h30 room	<b>Lecture Chhaibi</b> MIP		<b>Lecture Risser</b> MIP16h00-17h00		

## Lectures of the week

### **GEOMETRY and STATISTICS (8h) :**

Laurent RISSER

Lecture 1 (Monday) Optimal transport for image equalization.

Lecture 2 (Tuesday) Riemmanian metrics for image registration with LDDMM.

Lecture 3 (Wednesday) Deep learning with PyTorch.

### **OPTIMAL TRANSPORT AND STATISTICS (12h) : Application to Natural Language Processing (NLP)**

Reda CHHAIBI

Lecture 1 (Monday) A naive first approach: Word prediction via N-grams.

Lecture 2 (Wednesday) Word embeddings.

Lecture 3 (Thursday) On the numerics of optimal transport: Theory and Practice.

Lecture 4 (Friday) From Monge's earth mover's distance to the word mover's distance.