SPIGL'20

Joint Structures and Common Foundation of Statistical Physics, Information Geometry and Inference for Learning

26th July to 31st July 2020

https://franknielsen.github.io/SPIG-LesHouches2020/

8 Lectures (90 min)

Langevin Dynamics: Old and News (x 2) – Eric Moulines

Computational Information Geometry

On statistical distances and information geometry for ML – **Frank Nielsen**

Information Manifold modeled with Orlicz Spaces – **Giovanni Pistone**

Non-Equilibrium Thermodynamic Geometry

A variational perspective of closed and open systems- **François Gay-Balmaz**

A Homogeneous Symplectic Approach - **Arjan van der Schaft**

Geometric Mechanics

Gallilean Mechanics & Thermodynamics of Continua - **Géry de Saxcé**

Souriau-Casimir Lie Groups Thermodynamics & Machine Learning – **F. Barbaresco**

17 Keynotes (60 min)

Learning with Few Labeled Data - **Pratik Chaudhari**

Sampling and statistical physics via symmetry - **Steve Huntsman**

The Bracket Geometry of Measure-Preserving Flows and Diffusions - **Alessandro Barp**

Exponential Family by Representation Theory - **Koichi Tojo**

Learning Physics from Data - **Francisco Chinesta**

Information Geometry and Integrable Hamiltonian - **Jean-Pierre Françoise**

Information Geometry and Quantum Fields - **Kevin Grosvenor**

Thermodynamic efficiency implies predictive inference- **Susanne Still**

Diffeological Fisher Metric - **Hông Vân Lê**

Deep Learning as Optimal Control - **Elena Celledoni**

Schroedinger's problem, Hamilton-Jacobi-Bellman equations and regularized Mass Transportation - **Jean-Claude Zambrini**

Mechanics of the probability simplex - **Luigi Malagò**

Dirac structures in nonequilibrium thermodynamics - **Hiroaki Yoshimura**

Port Thermodynamic Systems Control - **Bernhard Maschke**

Covariant Momentum Map Thermodynamics - **Goffredo Chirco**

Contact geometry and thermodynamical systems - **Manuel de León**

Computational dynamics of multibody-fluid system in Lie group setting- **Zdravko Terze**