
COLLOQUE DES SCIENCES MATHÉMATIQUES DU QUÉBEC
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DATE :

Le vendredi 27 octobre 2017 / Friday, October 27, 2017

HEURE / TIME :

16 h / 4:00 p.m.

CONFÉRENCIER(S) / SPEAKER(S) :

Justin Solomon (MIT)

TITRE / TITLE :

Beneath the Surface: Geometry Processing at the Intrinsic/Extrinsic Interface

LIEU / PLACE :

UdeM, Pavillon André-Aisenstadt, salle 6254

RESUME / ABSTRACT :

Algorithms for analyzing 3D surfaces find application in diverse fields from computer animation to medical imaging, manufacturing, and robotics. Reflecting a bias dating back to the early development of differential geometry, a disproportionate fraction of these algorithms focuses on discovering intrinsic shape properties, or those measurable along a surface without considering the surrounding space. This talk will summarize techniques to overcome this bias by developing a geometry processing pipeline that treats intrinsic and extrinsic geometry democratically. We describe theoretically-justified, stable algorithms that can characterize extrinsic shape from surface representations.

In particular, we will show two strategies for computational extrinsic geometry. In our first approach, we will show how the discrete Laplace-Beltrami operator of a triangulated surface accompanied with the same operator for its offset determines the surface embedding up to rigid motion. In the second, we will treat a surface as the boundary of a volume rather than as a thin shell, using the Steklov (Dirichlet-to-Neumann) eigenproblem as the basis for developing volumetric spectral shape analysis algorithms without discretizing the interior.

Responsables :

Olivier Collin (UQÀM)

Henri Darmon (Université McGill)
Dimitris Koukoulopoulos (Université de Montréal)
Iosif Polterovich (Université de Montréal)
David Stephens (Université McGill)
Hugh Thomas (UQÀM)
Yi Yang (Université McGill)
