Wednesday 10 July 2019 – at 2.00 p.m.
Seminar Room “-1” – Department of Mathematics

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Generalized second fundamental form for varifolds: an application to point clouds

Abstract:
Metric properties of approximations of manifolds have been widely studied in computational geometry. Recently, a new general framework relying on geometric measure theory has been proposed by Buet, Leonardi and Masnou. It is based on the so-called notion of varifold, a weak notion of embedded manifold allowing to consider a large category of unsmooth and unstructured geometric data. A theory of generalized curvature has been developed, and provides extended definitions for mean curvature and second fundamental form, which are consistent with the smooth case. However, while a natural varifold can be associated to any submanifold in the Euclidean n-space, it is not clear how to construct, in practical applications, a varifold corresponding to some given discrete dataset. We will then deal with the question of choosing a mass distribution for a point cloud, such that the corresponding weak second fundamental form satisfies classical structural properties.

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