

# VARIFOLDS AND DISCRETE SURFACES

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We aim at connecting tools from geometric measure theory (varifolds) to practical issues in discrete geometry (notion of discrete curvature, geometric motions, surface comparison, etc.).

Varifolds have been introduced by F. Almgren in 1965 to study minimal surfaces. They have been widely used in order to study existence and regularity of solutions to geometric variational problems, but in general for theoretical purpose. The structure of varifold is flexible enough so that both regular surfaces and discrete surfaces (point clouds, triangulated surfaces or volumetric representations for instance) can be provided with a varifold structure, allowing to study surfaces and their different discretizations in a consistent unified setting. In this framework, we propose a notion of discrete mean curvature obtained by regularization of the first variation, which has nice estimation and convergence properties. We illustrate this notion on 2D and 3D examples.