

Phase-field models for shape processing

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Various problems in shape processing can be formulated quite naturally as optimization problems where a singular energy must be minimized under constraints. The phase-field approximation of such problems consists in approximating sharp functions by smooth functions and sharp energies by smooth energies in such a way that not only the energies converge, but also their constrained minimizers. In addition, and this motivates the approach, minimizers of the smooth energies are usually much easier to approximate numerically than minimizers of the sharp energies. The talk will be devoted to various examples in shape interpolation, denoising, reconstruction, and evolution where either isotropic or anisotropic energies of first or second-order are involved whose minimization under constraints can be successfully approximated with phase-field models.

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