Bijective Composite Mean Value Mappings

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November 29–30, 2013, Verona

Abstract

We introduce the novel concept of composite barycentric mappings and give theoretical conditions under which they are guaranteed to be bijective. We then focus on mean value mappings and derive a simple procedure for computing their Jacobians, leading to an efficient GPU-assisted implementation for interactively designing composite mean value mappings which are bijective up to pixel resolution. We provide a number of examples of 2D image deformation and an example of 3D shape deformation based on a natural extension of the concept to spatial mappings.

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