Poster

FLOWING: Implicit Neural Flows for Structure-Preserving Morphing

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[Abstract]

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Morphing is a long-standing problem in vision and computer graphics, requiring a time-dependent warping for feature alignment and a blending for smooth interpolation. Recently, multilayer perceptrons (MLPs) have been explored as implicit neural representations (INRs) for modeling such deformations, due to their meshlessness and differentiability; however, extracting coherent and accurate morphings from standard MLPs typically relies on costly regularizations, often leading to unstable training and impeding the effective alignment and interpolation between features. To overcome these limitations, we propose FLOWING (FLOW morphING), a framework that reframes warping as the construction of a differential vector flow, naturally ensuring continuity, invertibility, and temporal coherence.By design, FLOWING encodes structural flow propertiesdirectly into the network architectures, avoiding costly regularizations. This flow-centric approach yields principled and stable transformations that are smooth, reversible, and temporally coherent by construction, enabling accurate, structure-preserving morphing of both 2D images and 3D shapes.Extensive experiments across a range of applications—including face and image morphing, as well as Gaussian Splatting morphing—show that FLOWING achieves state-of-the-art morphing quality with substantially faster convergence. Code and pretrained models will be released.