3D Object Model Reconstruction Based on Polywogs Wavelet Network Parametrization

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Abstract : This paper presents a technique for compact three dimensional (3D) object model reconstruction using wavelet networks. It consists to transform an input surface vertices into signals,and uses wavelet network parameters for signal approximations. To prove this, we use a wavelet network architecture founded on several mother wavelet families. POLYnomials WindOwed with Gaussians (POLYWOG) wavelet families are used to maximize the probability to select the best wavelets which ensure the good generalization of the network. To achieve a better reconstruction, the network is trained several iterations to optimize the wavelet network parameters until the error criterion is small enough. Experimental results will shown that our proposed technique can effectively reconstruct an irregular 3D object models when using the optimized wavelet network parameters. We will prove that an accurateness reconstruction depends on the best choice of the mother wavelets.

Keywords : 3d object, optimization, parametrization, polywog wavelets, reconstruction, wavelet networks
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