PREDICTIVE VECTOR QUANTIZATION OF 3−D POLYGONAL MESH GEOMETRY BY REPRESENTATION OF VERTICES IN LOCAL COORDINATE SYSTEMS (ThuAmOR6)

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Abstract :

A large family of lossy 3−D mesh geometry compression schemes operate by predicting the position of each vertex from the coded neighboring vertices and encoding the prediction error vectors. In this work, we first employ entropy constrained extensions of the predictive vector quantization and asymptotically closed loop predictive vector quantization techniques that have been suggested in [3] for coding these prediction error vectors. Then we propose the representation of the prediction error vectors in a local coordinate system with an axis coinciding with the surface normal vector in order to cluster the prediction error vectors around a 2−D subspace. We adopt a least squares approach to estimate the surface normal vector from the non−coplanar, previously coded neighboring vertices. Our simulation results demonstrate that the prediction error vectors can be more efficiently vector quantized by representation in local coordinate systems than in global coordinate systems.

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