Joint Source and Channel Coding of MeshGrid-represented Objects

Author(s): Dan Cernea (VUB, Belgium)
Adrian Munteanu (VUB, Belgium)
Alin Alecu (VUB, Belgium)
Jan Cornelis (VUB, Belgium)
Peter Schelkens (VUB, Belgium)

Abstract: MeshGrid is a scalable 3D object representation method which is part of MPEG-4 AFX. This paper proposes a new approach for optimized protection of MeshGrid-represented objects against transmission errors occurring over error-prone channels. An unequal error protection approach is followed, to cope with the different error-sensitivity levels characterizing the various resolution and quality layers produced by MeshGrid. The protection level to be employed for each layer is determined by solving a joint source and channel coding problem. The L-infinite distortion metric is used, and its superiority over the classical L-2 norm is proven. In this context, a novel fast algorithm for solving the optimization problem is conceived. The proposed joint source and channel coding approach offers resilience against transmission errors, enables a real-time implementation, and preserves all the scalability features and animation capabilities that characterize MeshGrid.