Temporally Coherent 3D Animation Reconstruction from RGB-D Video Data

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Abstract : We present a new method to reconstruct a temporally coherent 3D animation from single or multi-view RGB-D video data using unbiased feature point sampling. Given RGB-D video data, in form of a 3D point cloud sequence, our method first extracts feature points using both color and depth information. In the subsequent steps, these feature points are used to match two 3D point clouds in consecutive frames independent of their resolution. Our new motion vectors based dynamic alignment method then fully reconstruct a spatio-temporally coherent 3D animation. We perform extensive quantitative validation using novel error functions to analyze the results. We show that despite the limiting factors of temporal and spatial noise associated to RGB-D data, it is possible to extract temporal coherence to faithfully reconstruct a temporally coherent 3D animation from RGB-D video data.