

Skinned Motion Retargeting with Preservation of Body Part Relationships

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Abstract—Motion retargeting is an active research area in computer graphics and animation, allowing for the transfer of motion from one character to another, thereby creating diverse animated character data. While this technology has numerous applications in animation, games, and movies, current methods often produce unnatural or semantically inconsistent motion when applied to characters with different shapes or joint counts. This is primarily due to a lack of consideration for the geometric and spatial relationships between the body parts of the source and target characters. To tackle this challenge, we introduce a novel spatially-preserving Skinned Motion Retargeting Network (SMRNet) capable of handling motion retargeting for characters with varying shapes and skeletal structures while maintaining semantic consistency. By learning a hybrid representation of the character's skeleton and shape in a rest pose, SMRNet transfers the rotation and root joint position of the source character's motion to the target character through embedded rest pose feature alignment. Additionally, it incorporates a differentiable loss function to further preserve the spatial consistency of body parts between the source and target. Comprehensive quantitative and qualitative evaluations demonstrate the superiority of our approach over existing alternatives, particularly in preserving spatial relationships more effectively.

Index Terms—Motion Retargeting, Spatial Relationship, Different Structure

