Temporal Scaling of Upper Body Motion for Sound Feedback System of a Dancing Humanoid Robot

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→ Goal

A Dancing-to-Music ability for CG characters & humanoids

Motion Rhythm should be synchronized with Musical Rhythm.

→ Difference of Motion Details

Green: Dance performance at normal musical speed
Yellow: Dance performance at 1.3 times faster musical speed

Observation in Frequency Domain Using Hierarchical B-Spline

→ Insights through Observation

• Mean Joint Angle

High frequency components are gradually attenuated depending on the musical speed.

• Variance of Joint Angle

Important stop motions are preserved even when high frequency components are attenuated.

(Green: Normal speed  Yellow: 1.2 times faster  Light blue: 1.5 times faster  Blue: All)

→ Algorithm

(1) Motion Decomposition Using Hierarchical B-Spline

(2) Parameter Optimization for Each Segment

(3) Whole Motion Reconstruction

→ Results

Simulation Result of Generating 1.2 times faster motion

Publications