

Dancing-to-Music Character Animation

音楽情景を考慮した舞踊動作の自動生成

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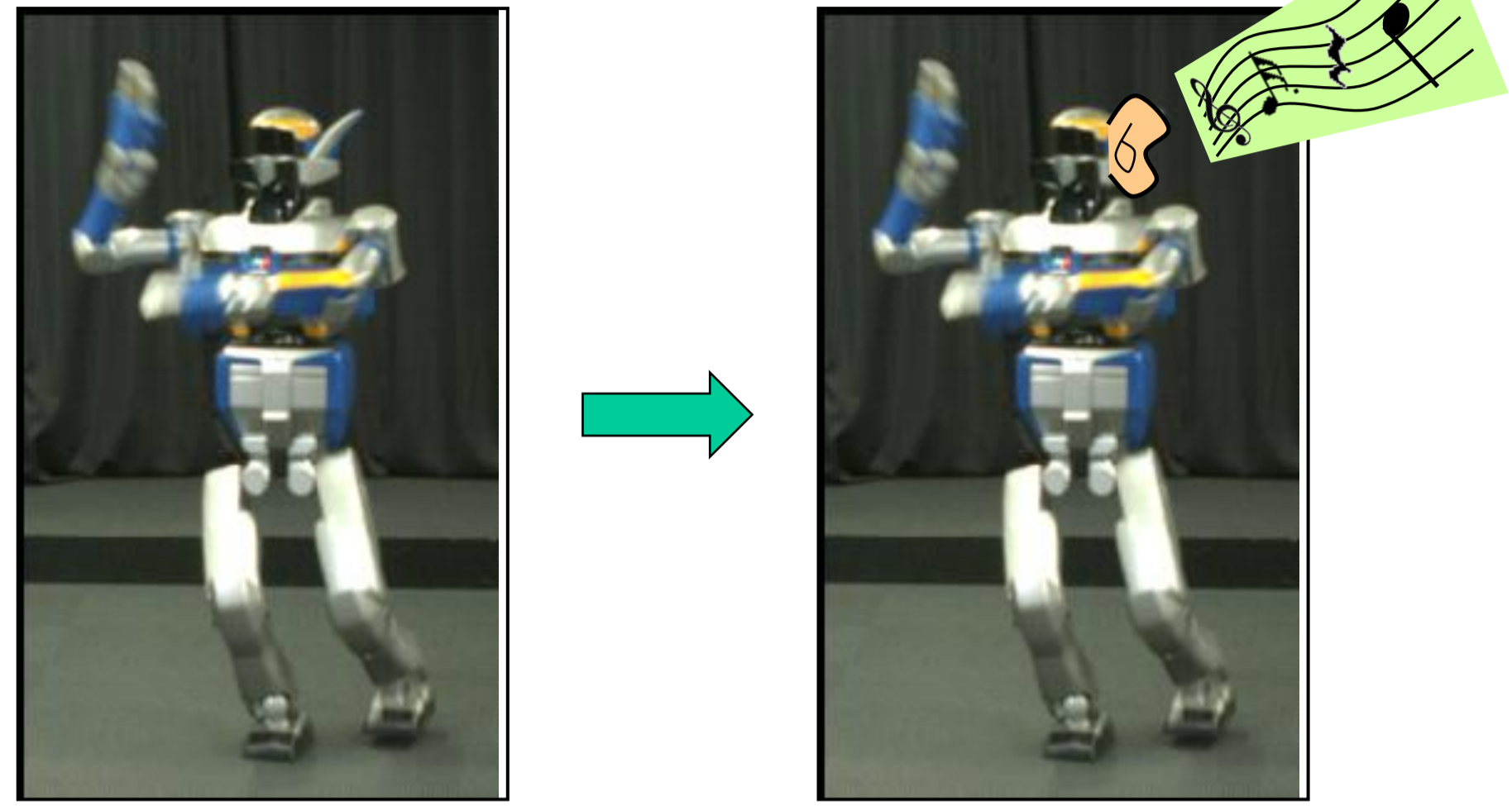
中澤 篤志

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池内 克史

→ Goal

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



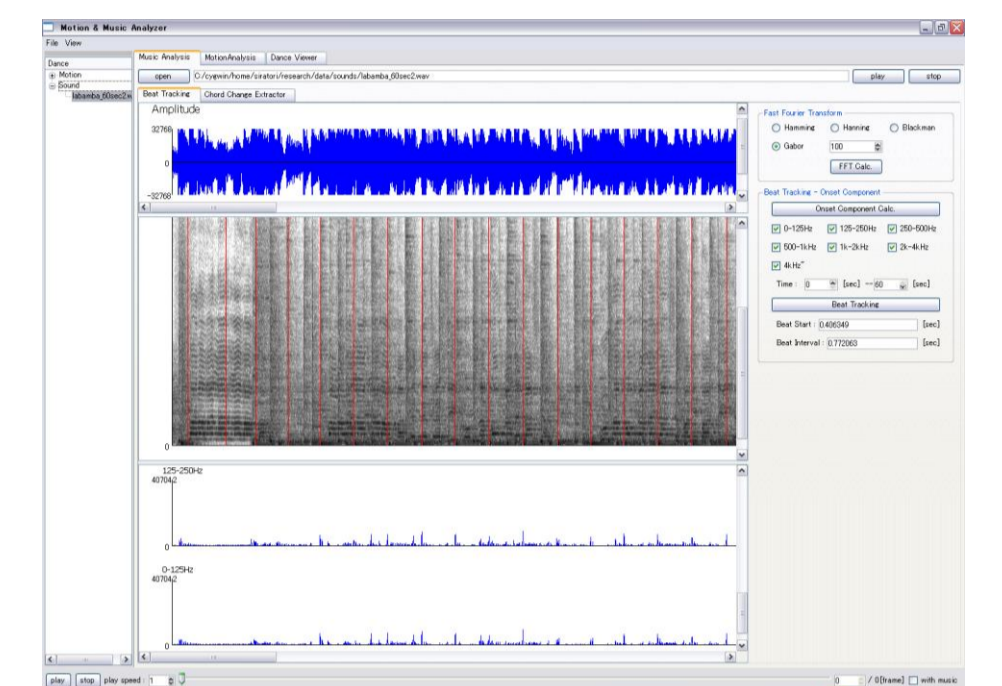
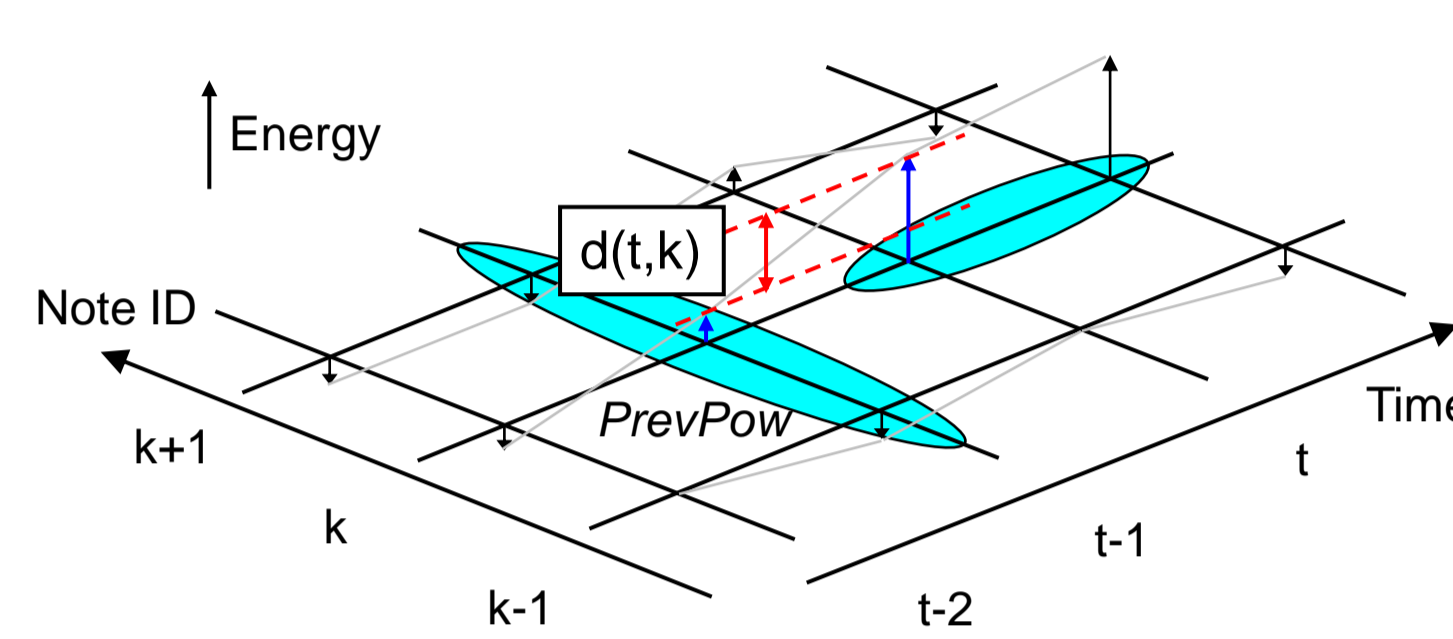
Motion and music relationship model

1. Rhythm model – Motion keypose and music rhythm
2. Intensity model – Motion “weight effort” and music melody

→ Music Feature Analysis

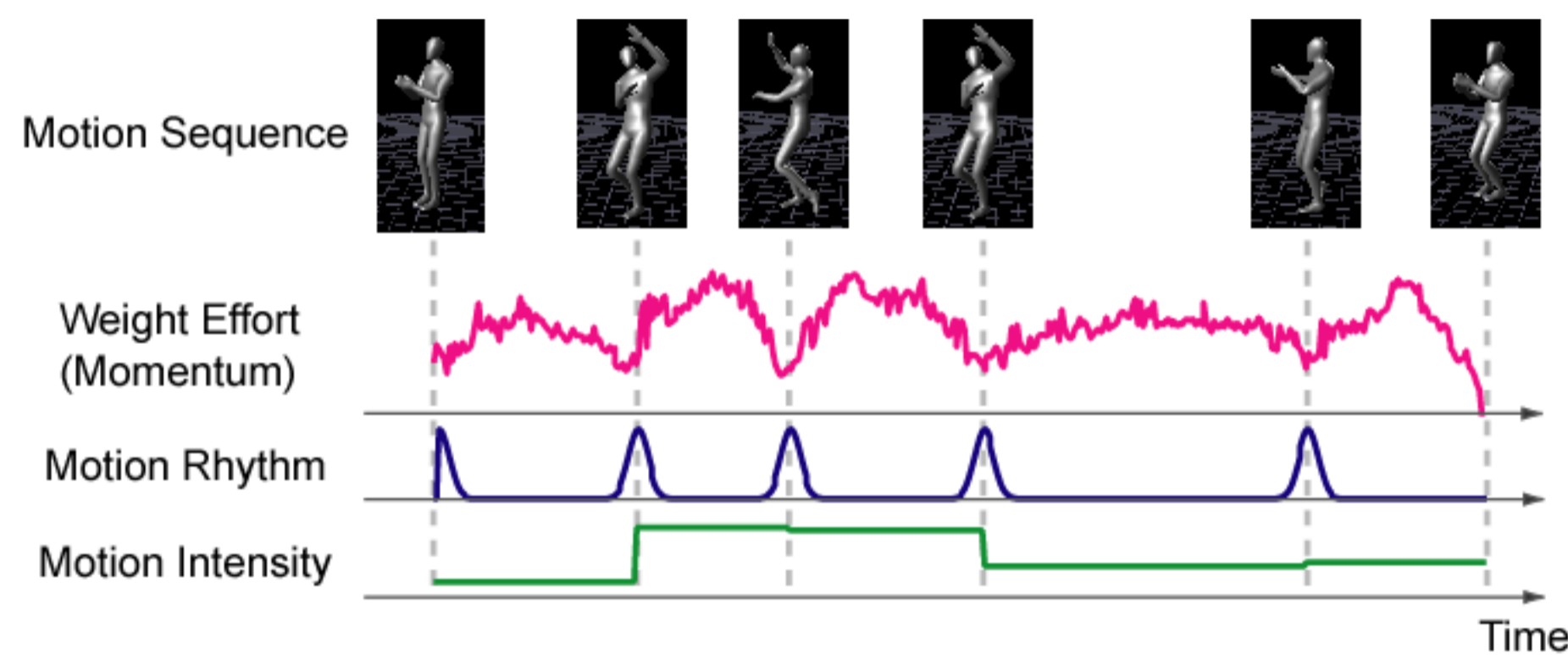
Important music features for dance performance

- Structure
 - Performers tend to keep phrases from being violated.
 - Timbre-invariant repeating phrases detection
- Rhythm
 - Everyone experiences a desire to dance to music.
 - Onset component-based estimation
- Intensity
 - People feel excited when listening to rock music.
 - Sound pressure level of melody line



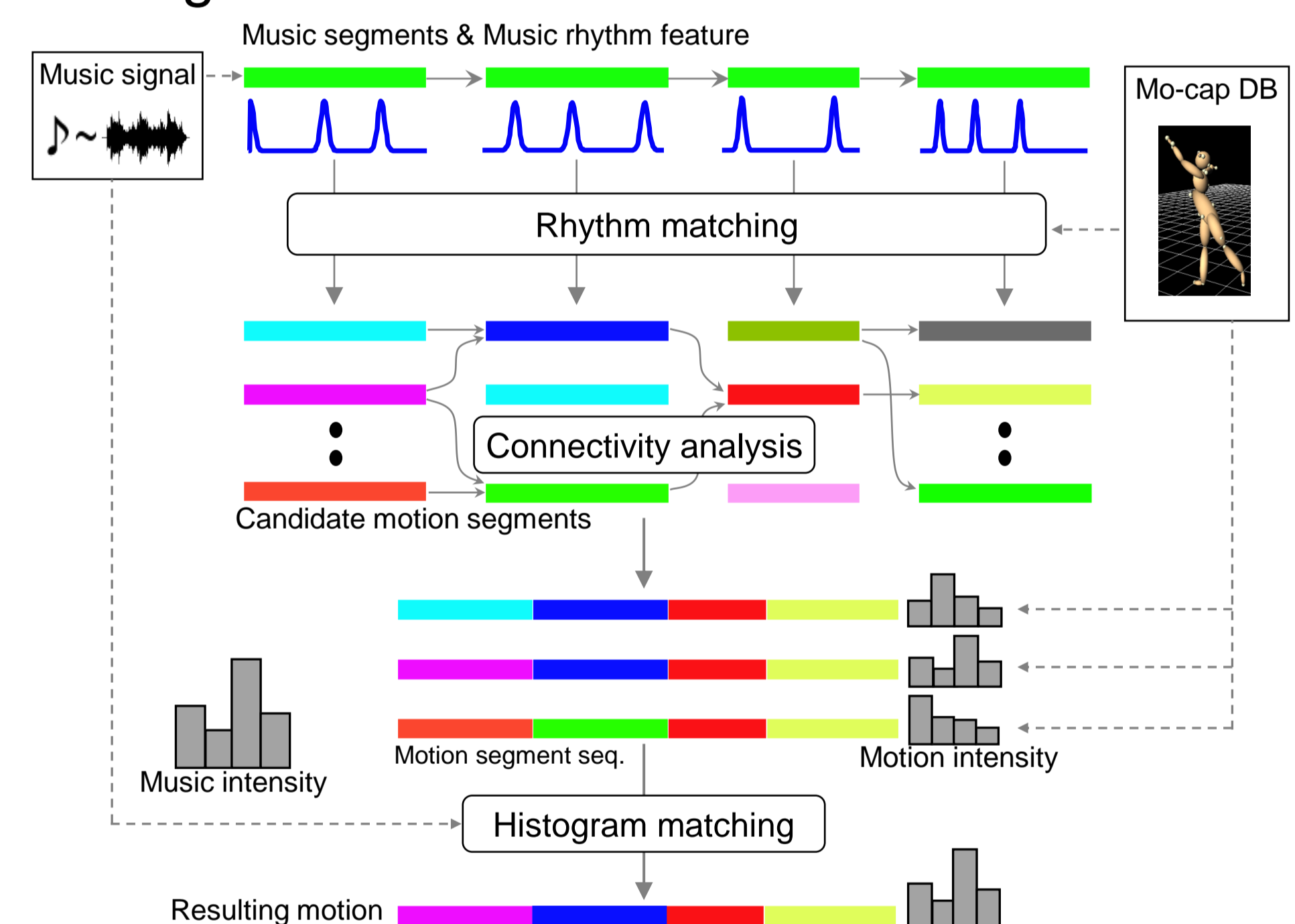
→ Motion Feature Analysis

- *Weight effort*
 - Strength of motion defined by Laban
 - Approximated instantaneous momentum magnitude
- Rhythm
 - Stop motions (keyposes)
 - Local minimum of weight effort
- Intensity
 - The higher intensity, the more exciting motion.
 - Average of weight effort and velocity of body



→ Dance Performance Synthesis

1. Motion segment retrieval based on rhythm component matching
2. Motion connectivity analysis
3. Intensity component matching between motion and music segments

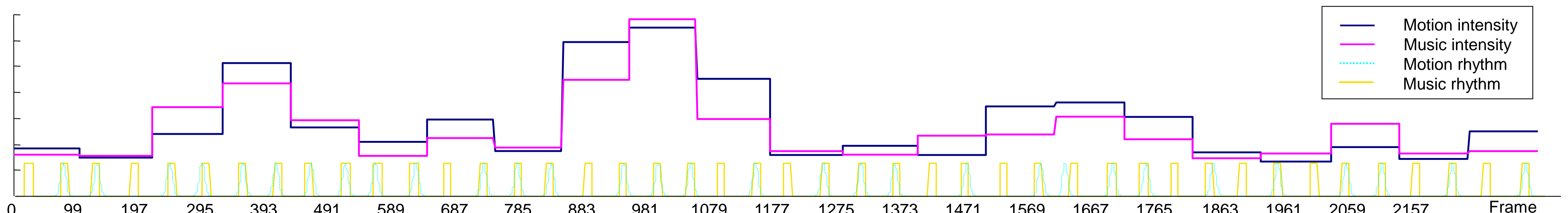


→ Results

This CG character is dancing to tango music “La Cumparsita”



Result of feature matching



Publications

1. T. Shiratori, A. Nakazawa, K. Ikeuchi, “Dancing-to-Music Character Animation”, In *Computer Graphics Forum*, Vol. 25, No. 3 (also in *Eurographics 2006*), Sep. 2006 (to appear)
2. T. Shiratori, A. Nakazawa, K. Ikeuchi, “Synthesizing Dance Performance Using Musical and Motion Features”, In *Proc. of IEEE International Conference on Robotics and Automation (ICRA 2006)*, May 2006