Rule-based Retrieval of Human Motion Data Using Inductive Logic Programming
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Abstract
We propose a novel method for automatically classifying and retrieving motions based on spatio-temporal features of motion appearance. Our method first converts a motion data into a form of clausal language that represents geometrical relations between human body parts and their temporal relations. A classification rule is then learned from the minimal set of manually classified examples using inductive logic programming. We introduce a two-step search algorithm to retrieve motion segments from the motion database, which uses two types of classification rules that are discovered by different learning models. Our method allows robust and efficient retrieval from complex motion sequences with a small number of training data.

Spatio-temporal Features of Human Motion
Geometric features [Muller et al. 2005] and their temporal relations.

Our extension:
- Multi-valued geometric features
- Additional features (jump, twist, direction)
- Temporal relation and duration of GFs

Clausal representation of the features

Positive example (Throwing)

Negative example (Other motions)

Inductive Learning of Motion Classification Rules

Experimental Result
Training examples: Walk (11), Run (13), Jump (6), Throw (6), Sit (6), Lift (6)
- Classification of the training examples

Retrieval from complex motion sequence

Future Work
- Probabilistic or fuzzy representation of spatial and temporal features
- Retrieval of appropriate unit movement
- Other background knowledge (kinematic/dynamic constraints)

Future Work

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