保序Wasserstein鉴别分析

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Introduction

➢Motivation

- Temporal representation matters
- ***Low-dimensional***: reduce the running time
- ***Discriminative***: improve the performance

➢DRS Problem:

- Dimensionality reduction for sequences
- ***Difficulty:*** Build the separability, formulate/optimize the objective, temporal alignment

➢Related work

- Most existing DRS methods such as LSDA employ *dynamic time warping (DTW)* for alignment.
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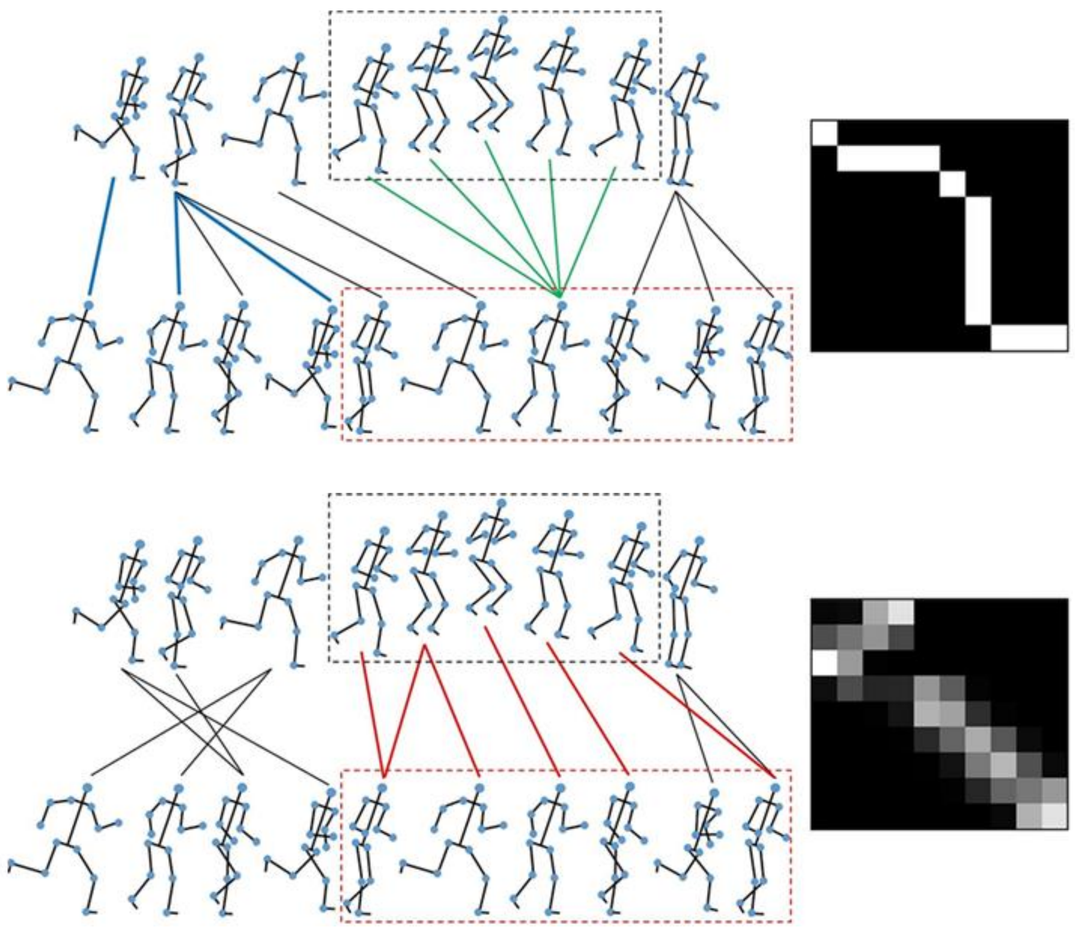


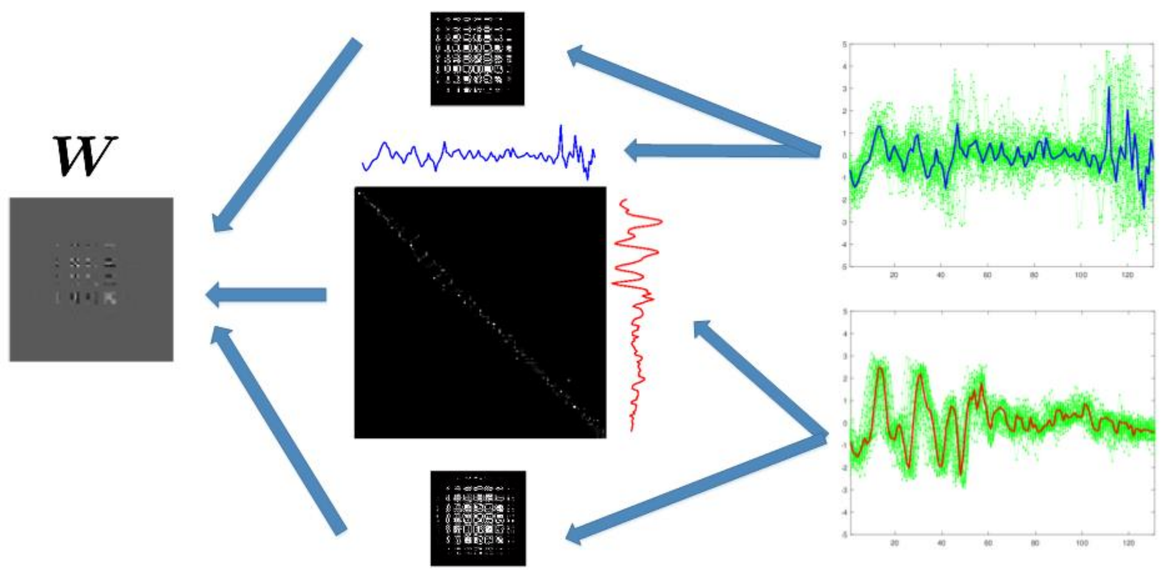
➢Our method

- Employ the *order-preserving Wasserstein (OPW)* distance as distance measure between sequences
- Derive the OPW barycenter
- Construct OPW barycenter-based separability
- Construct intra-class and inter-class scatters based on the learned optimal transports

OWDA Overview

➢Order-preserving Wasserstein Discriminant Analysis

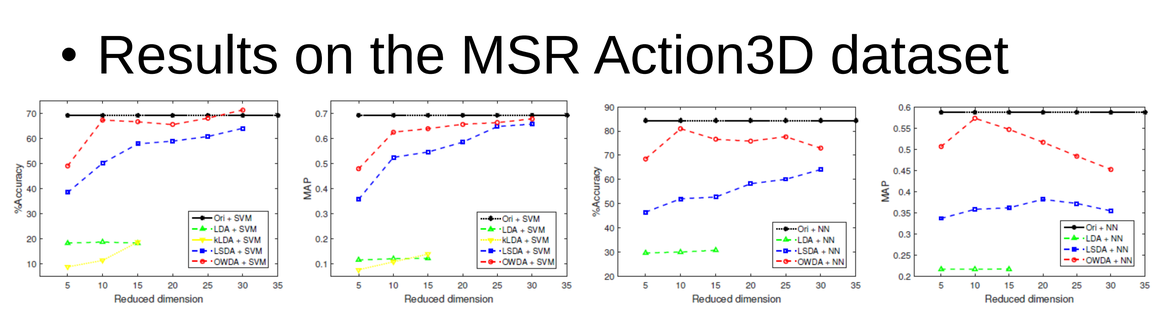
- Extract the barycenter for each class
- Extract intra-class and inter-class scatters based on the barycenters
- Learn the projection



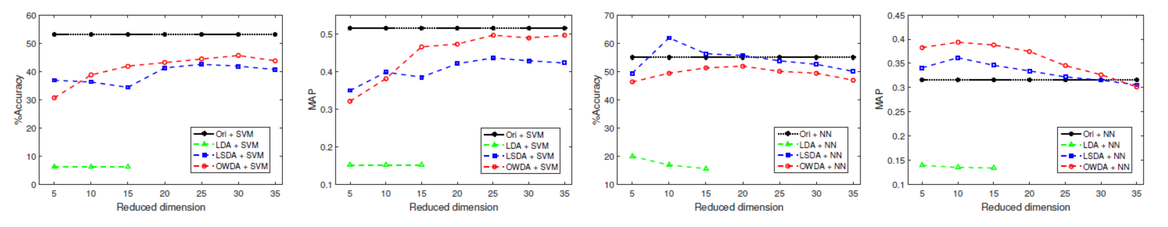
Experimental Results

➢Comparison with other DRS methods

- Two classifiers: Rank pooling+SVM, OPW+NN
- Results on the MSR Action3D dataset



- Results on the MSR Activity3D dataset



- Results on the ChaLearn dataset