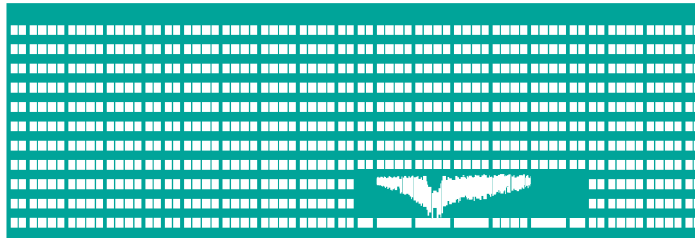


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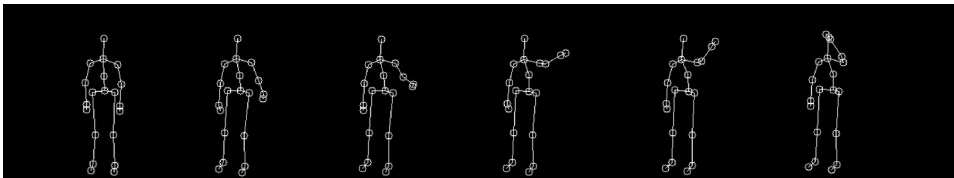
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Skeleton Action Recognition Based on Singular Value Decomposition

Ing. Radek Simkanič, DiS.

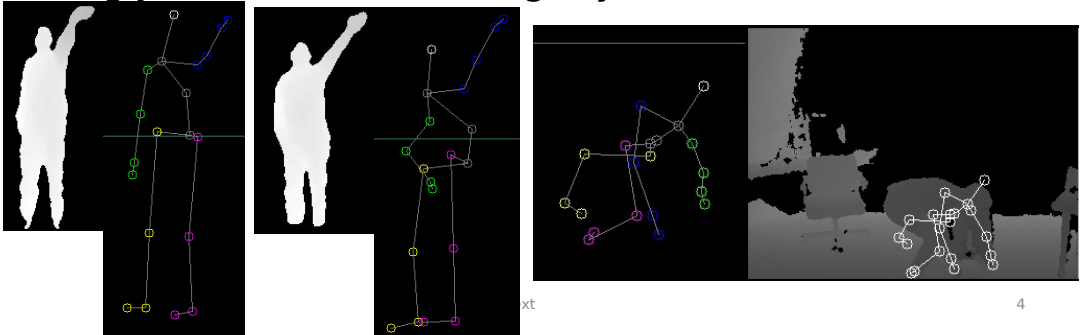


Main topics

- Motivation
- Proposed method
- Datasets
- Experiments

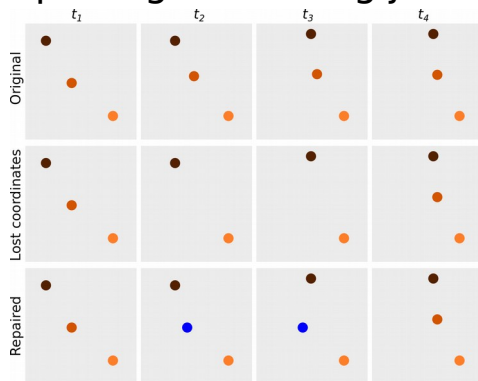
Motivation

- Inaccurate joint coordinates
- Missing joint coordinates (e.g. by occlusion)



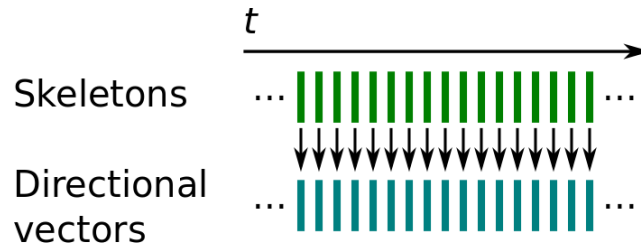
Proposed method - 1st step

- Repairing of missing joint coordinates



Proposed method - 2nd step

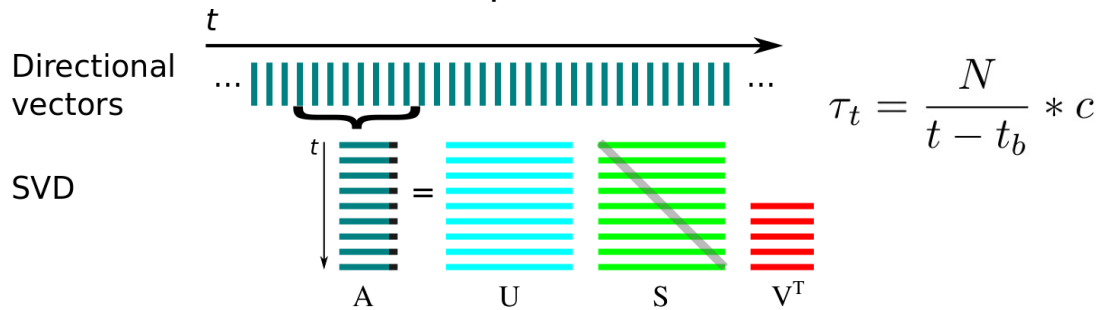
- The skeletons transformations to sets of directional vectors



$$d_{i,t} = p_{j_1, j_2, t} = J_{j_1, t} - J_{j_2, t} \mid j_1 < j_2$$

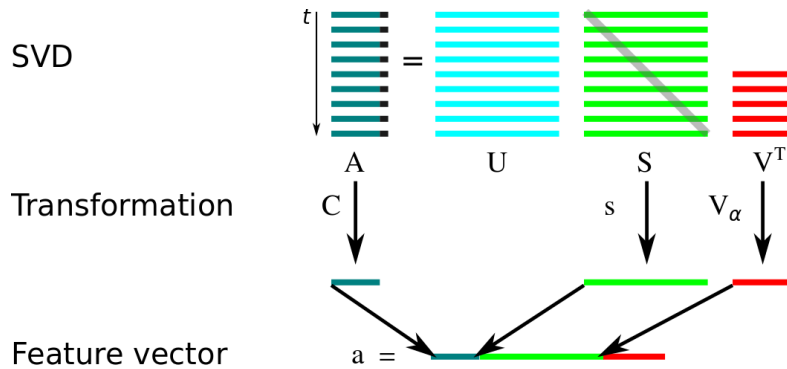
Proposed method - 3rd step

- Create A matrix and compute SVD



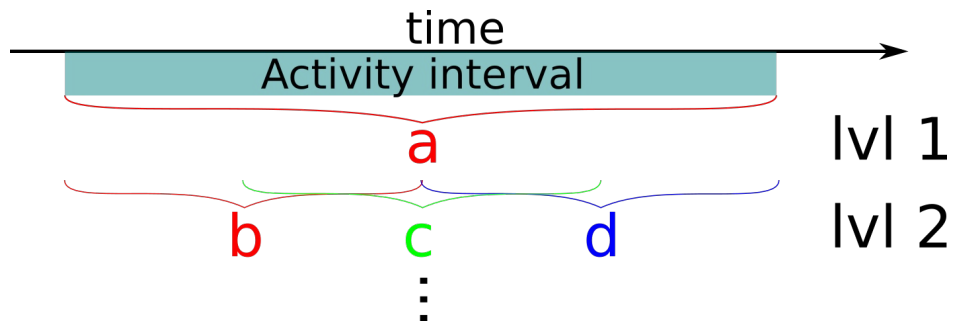
Proposed method - 4th step

- Compute centroids and angles



Proposed method - 5th step

- Temporal pyramid



Datasets

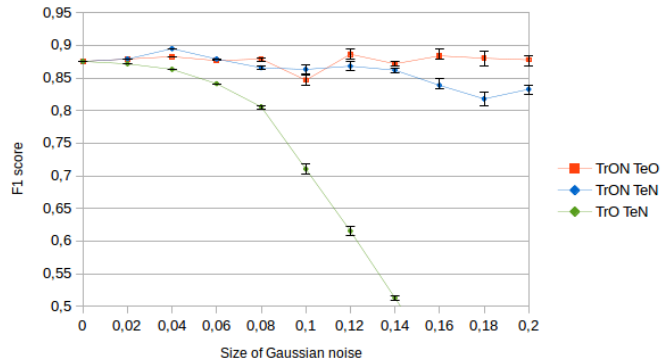
- MSR-Action 3D
- UTKinect-Action 3D
- Florence3D-Action

Experiments

- Robustness analysis when the Gaussian noise is applied
- Robustness analysis supposing some joint coordinates are lost
- Standard experimental protocols of datasets

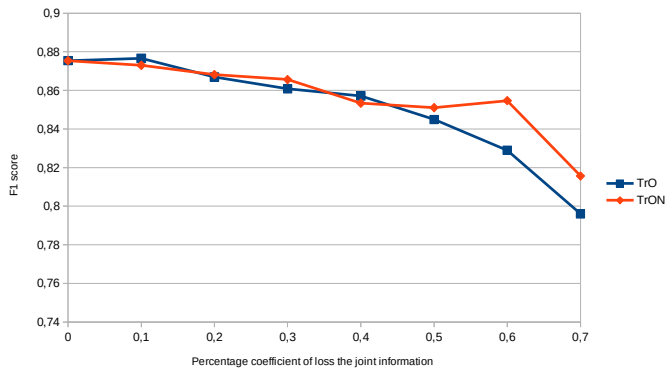
Experiments - Gaussian noise

- MSR-Action 3D - Cross-subject protocol



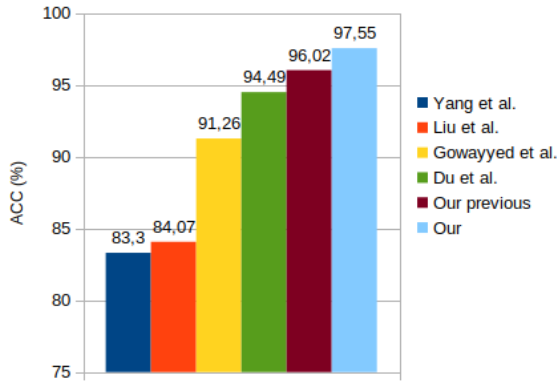
Experiments - Lost coordinates

- MSR-Action 3D - Cross-subject protocol

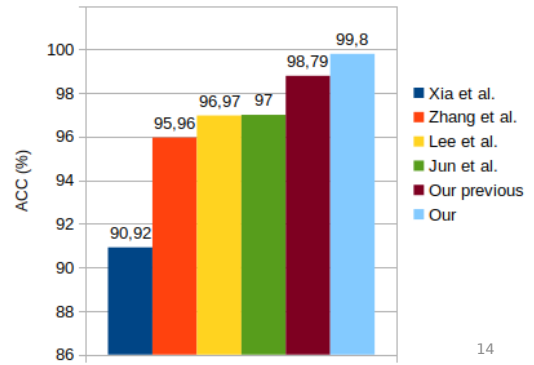


Experiments - Dataset protocols

MSR-Action 3D - cross-subject protocol

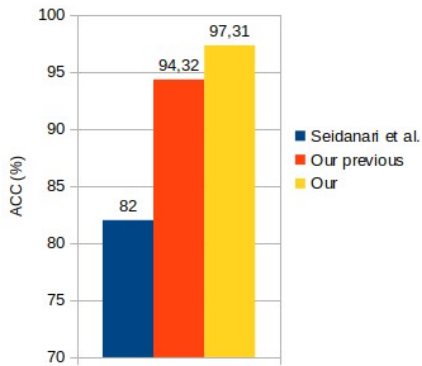


UTKinect-Action 3D - cross-subject protocol

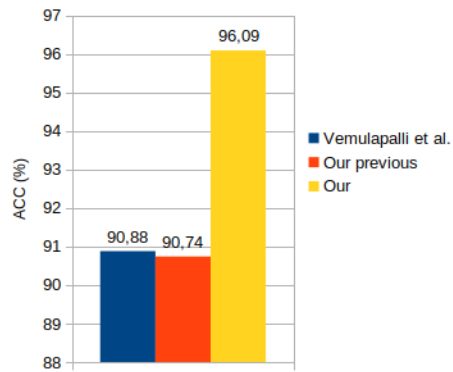


Experiments - Dataset protocols

Florence 3D - LOAO protocol



Florence 3D - cross-subject protocol



Thank you for your attention

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