

Visible Joint Classification and Temporal Segment Matching with Specific Constraints of Action based 3D Pose Refinement for Volleyball Receive Analysis

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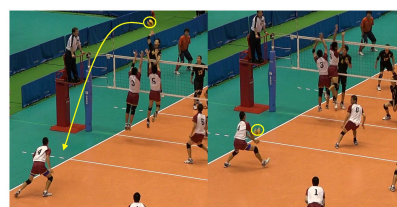
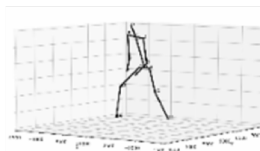
Background

2D pose of 4 views

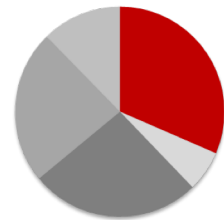
3D pose



Reconstruct



- Receive
- Server
- Attack
- Setting
- Block

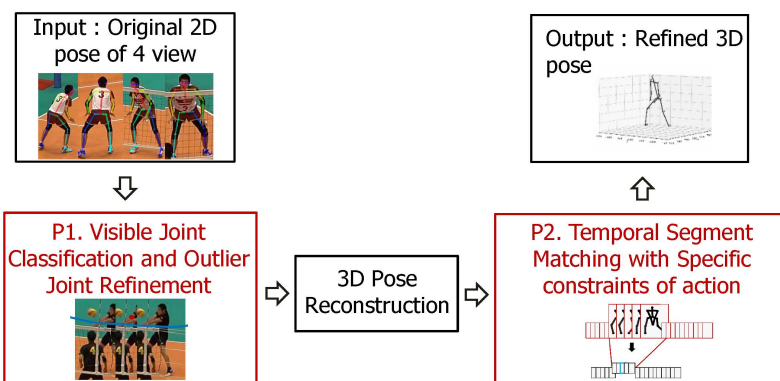


Challenges

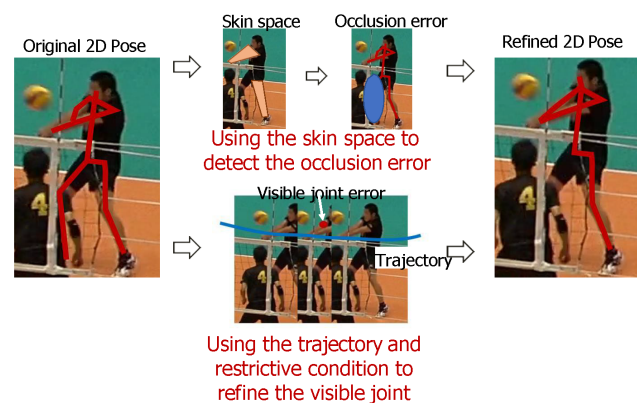
- Abnormal pose
- Self-occlusion

Proposed method

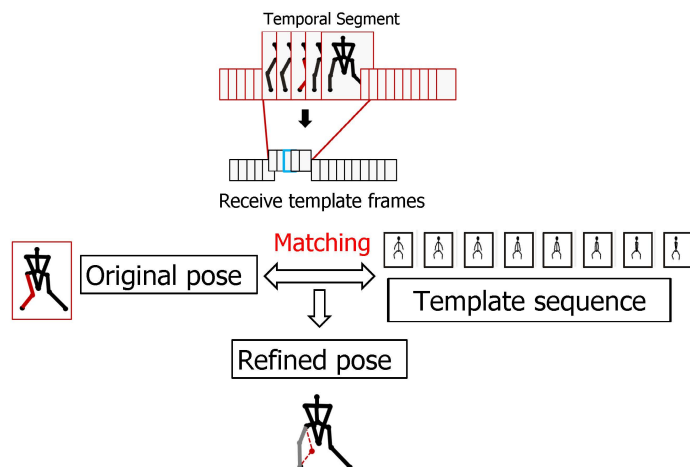
Overall framework



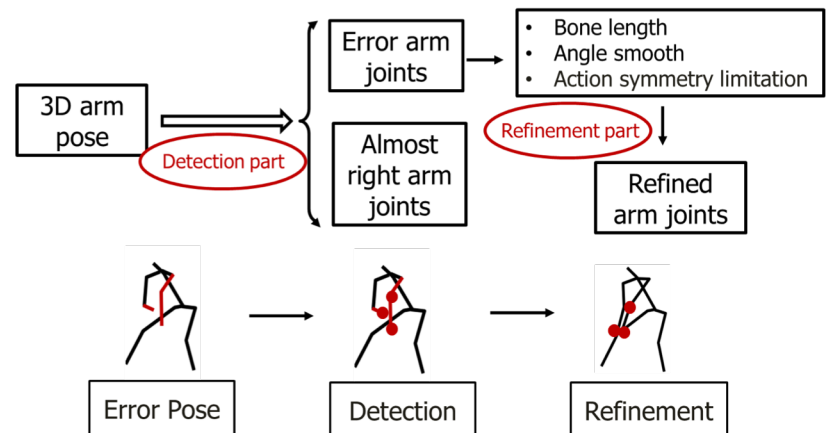
P1: Visible Joint Classification and Outlier Joint Refinement



P2.1: Temporal Segment Matching Refinement



P2.2: Specific Constraints of Receive Action



Experiments Result

Item		Without refinement (Accuracy %)	P1 (Accuracy %)	P1+P2.1 (Accuracy %)	P1+P2.1+P2.2 (Accuracy %)
Error range [%] @ 30mm	Upper body	83.43	91.88	91.88	91.94
	Total body	90.83	95.33	95.33	95.36
Error range [%] @ 50mm	Upper body	87.81	94.69	94.87	95.01
	Total body	93.17	96.83	96.92	96.99
Error range [%] @ 70mm	Upper body	92.50	96.25	97.01	97.27
	Total body	96.01	98.01	98.43	98.55

Conclusion The proposed method achieves that the percentage of correct key points in 70mm is up to 98.5% and in 30mm is up to 95.4%.



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