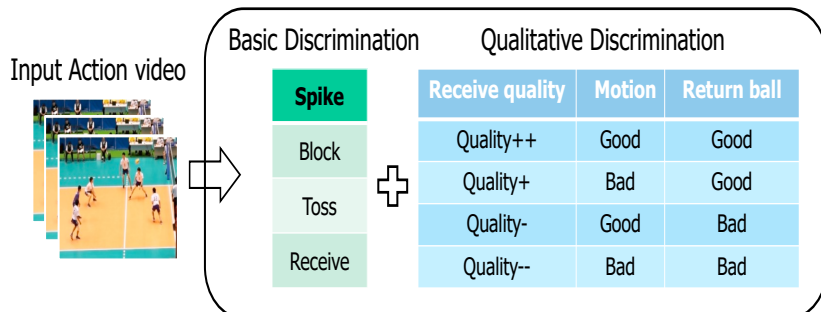


Team Formation and Abrupt Pose Features Based Qualitative Action Recognition for Volleyball Game Analysis

修士課程卒業 劉洋

Background

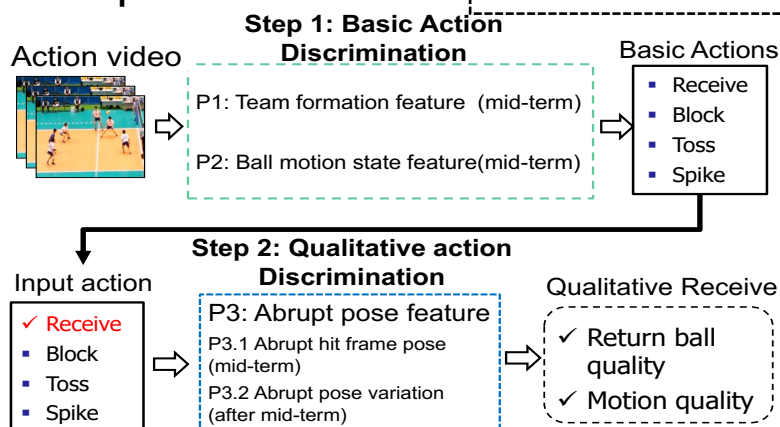


Applications:

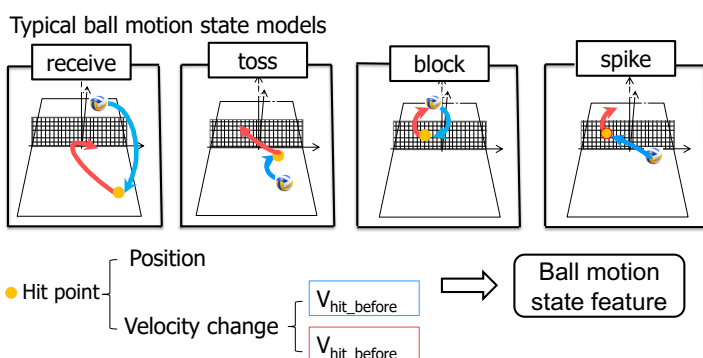
- ✓ Assist player training
- ✓ Player evaluation system
- ✓

Proposals

Overall framework

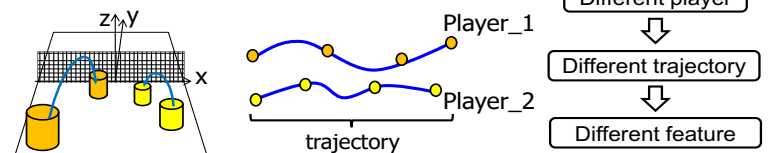


Ball motion state feature

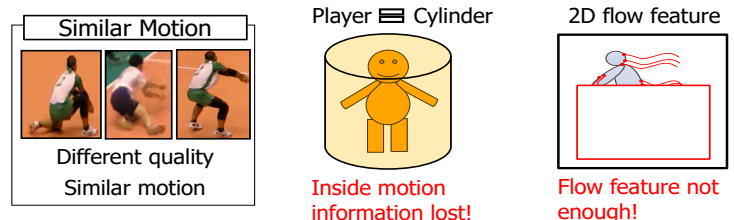


Problems

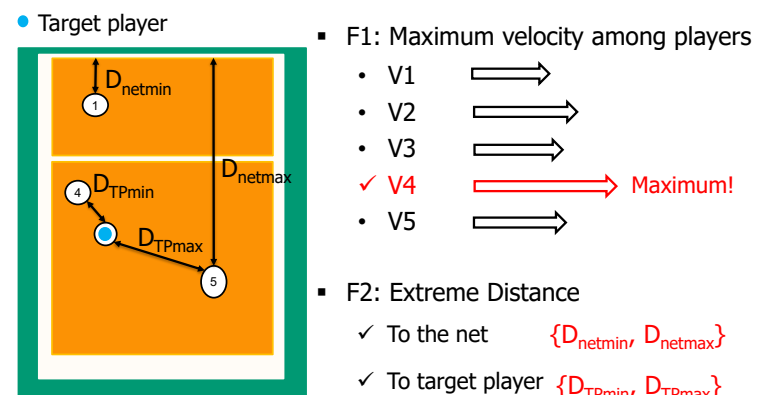
Problem 1: Not robust to player change



Problem 2: Weak at similar motion classification



Team formation feature



Abrupt pose feature

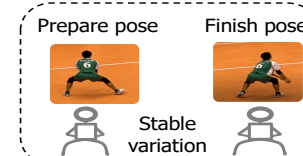
Factor1: Motion Standard



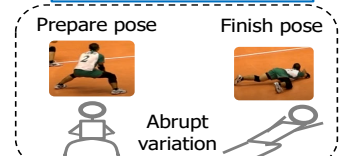
Abrupt Hit Frame Pose



Factor2: Motion Stability



Abrupt Pose Variation



Experiment Result

Basic Action Discrimination

Spike			Block			Receive			Toss		
accuracy	recall	precision	accuracy	recall	precision	accuracy	recall	precision	accuracy	recall	precision
98.41%	92.41%	100%	96.49%	92.14%	94.73%	97.29%	96.12%	96.12%	96.85%	88.93%	97.30%

Qualitative Receive Discrimination

Quality++			Quality+			Quality-			Quality--		
accuracy	recall	precision	accuracy	recall	precision	accuracy	recall	precision	accuracy	recall	precision
94.41%	96.24%	88.50%	92.73%	72.95%	71.39%	94.97%	65.28%	64.88%	90.50%	63.50%	60.00%

Conclusion

This work achieved accuracy averagely 97.26% for basic action discrimination and 91.76% for qualitative receive discrimination



Graduate School of Information, Production and Systems
Waseda University