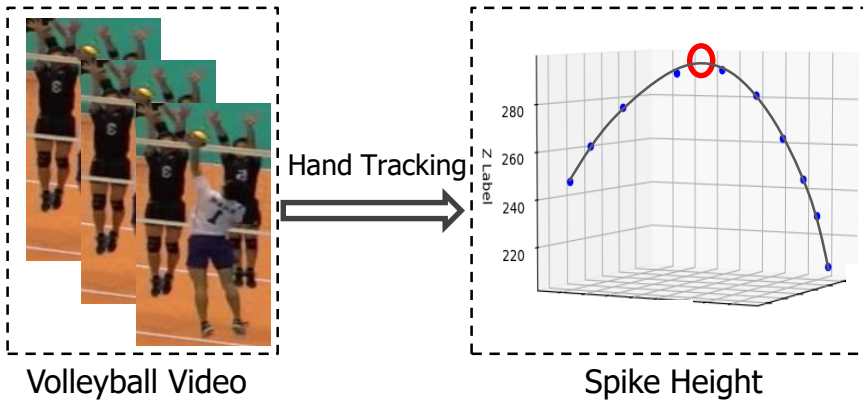


Body Part Categorization Based Tracking with Correction by Temporal Positions for Volleyball Spike Height Analysis

修士課程卒業 李 孜肯

Background



Application

- Attack Evaluation
- Player Evaluation
- ...
- Strategy Analysis

Problems

① High Similarity Between Hands



② Deformation

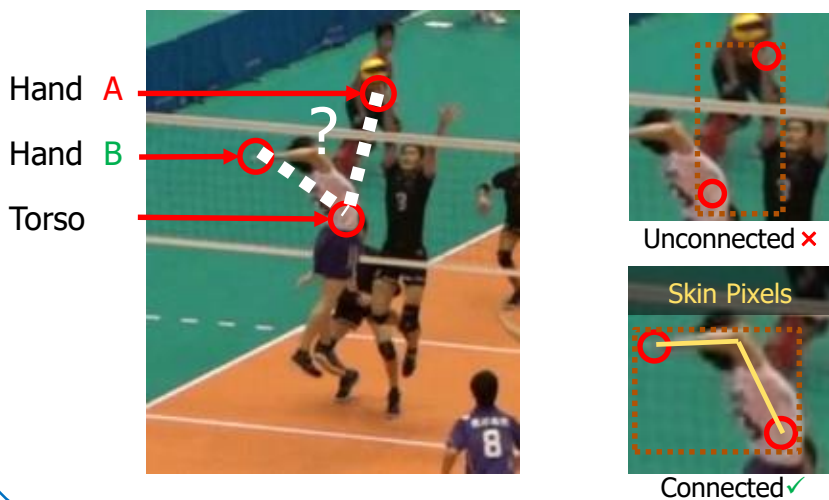


③ Occlusion

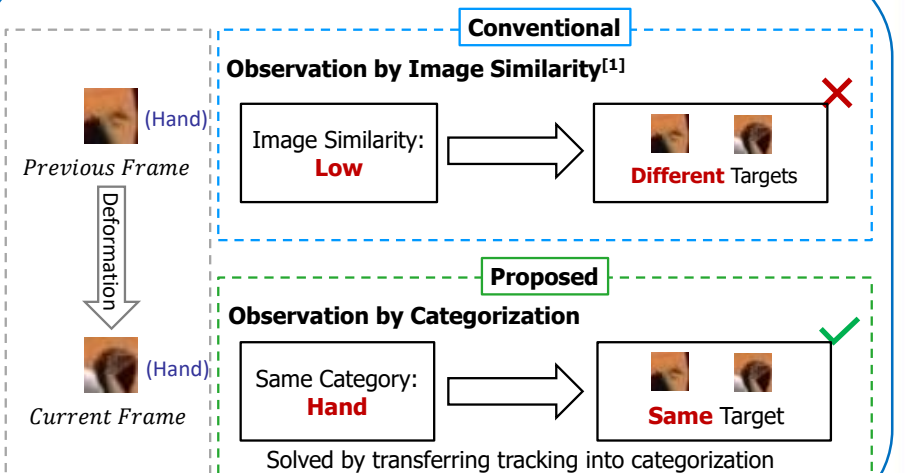


Proposals

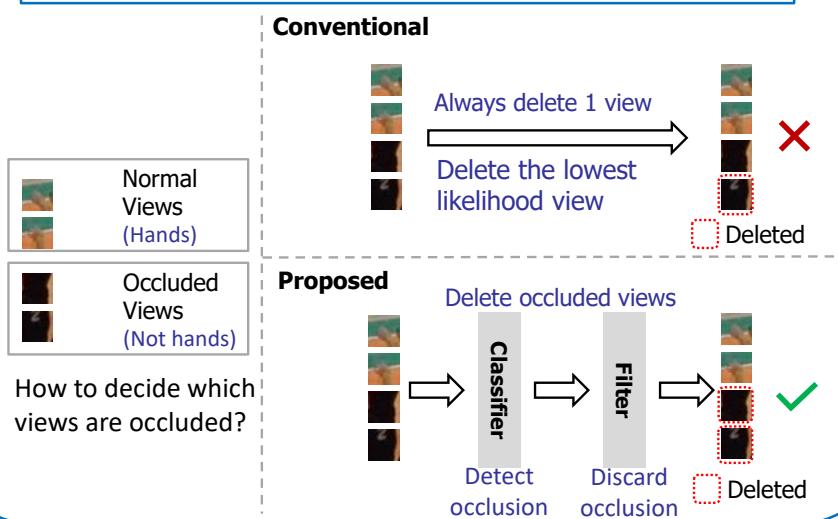
P1: Skin Pixel Filter Based Link Field Detection



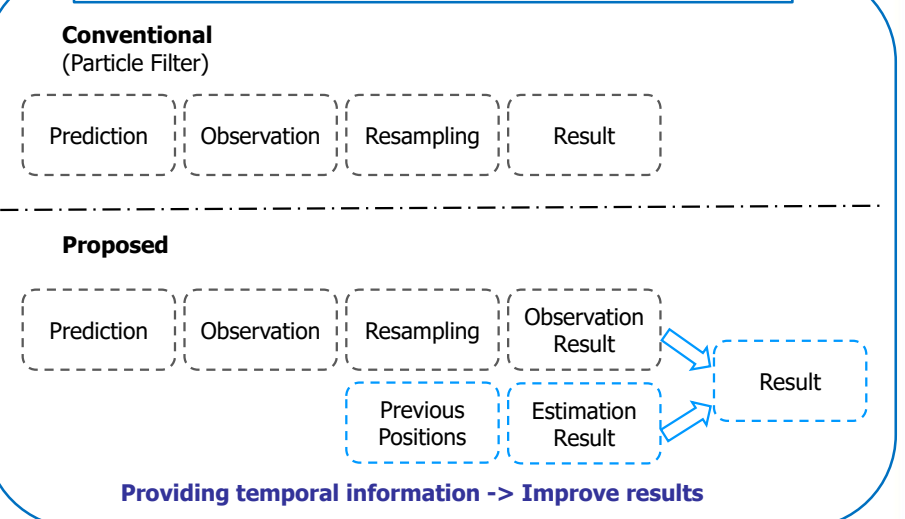
P2: Body Part Categorization Based Observation Model



P3: Occlusion Detection and Discard Based Observation Model



P4: Temporal Positions Based Tracking Result Correction



Experiment result

| Test Method | Success Rate | Average Error of Spike Height |
|-----------------|------------------|-------------------------------|
| Basic Framework | 34.69% (68/196) | 16.39cm |
| P1 | 45.41% (89/196) | 14.16cm |
| P1+P2 | 75.51% (148/196) | 11.73cm |
| P1+P2+P3 | 84.18% (165/196) | 8.47cm |
| P1+P2+P3+P4 | 93.37% (183/196) | 5.96cm |

Conclusion By 4 proposals, the success rate increases to 93.37%, and the average height error is 5.96cm.

