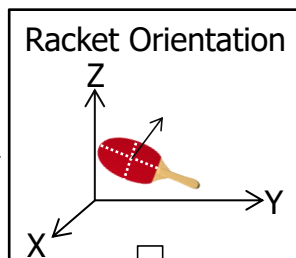


Differential Sampling based Descriptor and View Voting Constraint in Template Matching for Table Tennis Racket Orientation Detection

修士課程卒業 鐘 凌瀟

Background

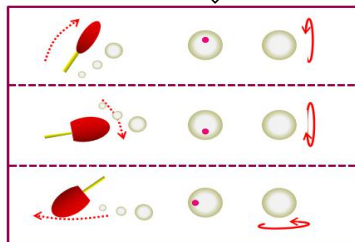
Table Tennis Sport



Racket's
fixed shape

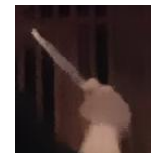
Obtain contour
for **orientation**

Application:
**Ball rotation
analysis**



Problems

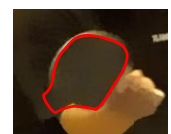
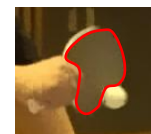
➤ Problem 1: Disappear



Side to camera

Occlusion

➤ Problem 2: Inaccurate Contour

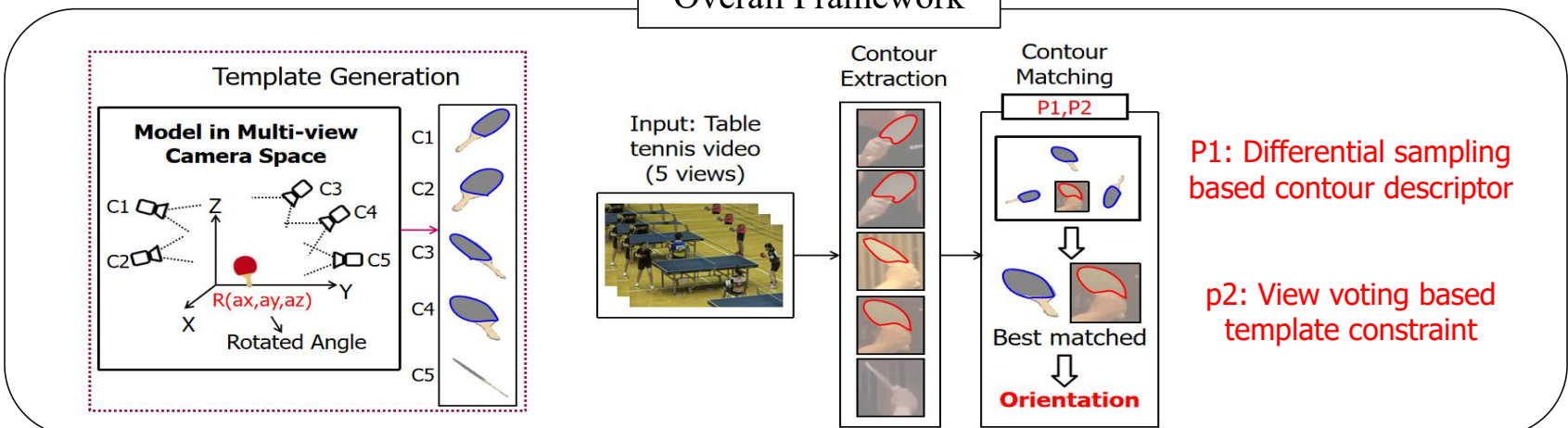


Occlusion

Background

Proposals

Overall Framework



Differential sampling based contour descriptor

Proposed Descriptor



Correct Part:
➤ High weight
Occlusion Part:
➤ Low weight

Influence
contour



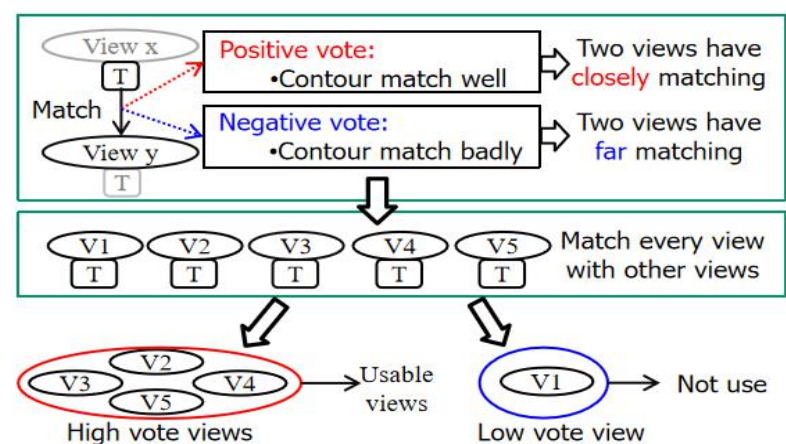
Correct



➤ **Sparse Sampling**
→ Low weight

➤ **Dense Sampling**
→ High weight

View voting based template constraint



Experiment Result

Item:	Action Type	Chop	Smash	Drive	Block	Flick	Average
Angle error (degree)	P1	4.22	5.45	5.40	5.13	6.03	5.25
	P1+P2	3.71	3.87	3.85	3.83	3.96	3.84

Conclusion

This work achieved angel error averagely 3.84 degrees for racket orientation detection



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