State Detection and Position Reset based Particle Filter Tracking for Large-size and Long-term Full Occlusion

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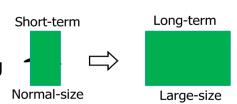
Background

- Application
 - Video Surveillance
 - Vehicle navigation
 - **.**..

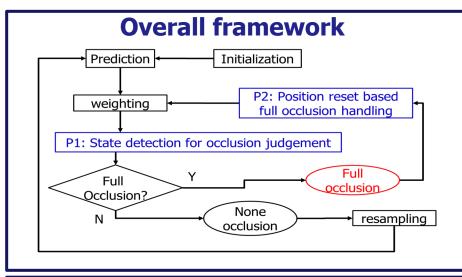


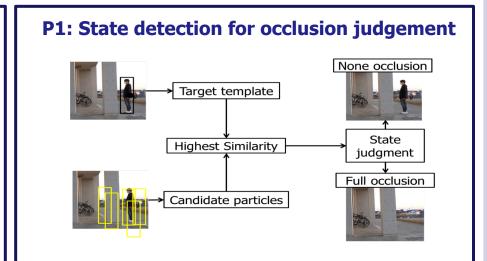


- Target
- Tracking in full occlusion with large-size barrier and long-term occlusion scenes
- Challenges
- Trajectory break off
- Long-term disappearing
- Motion change
- **.**..

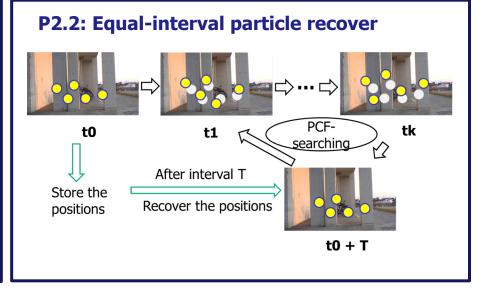


Proposed method





P2: Position reset based full occlusion handling Barrier-fitted boundary detection Target found Particle types poor matched Target reappear well matched from obstacle Particles distribution reset with Position Correction Filter (PCF) particles initial particles new distribution distribution



Experiments Result

Item	Times	CW 2021		Sun's work		Proposed	
SS,ST	42	29/ 42	69.04%	40/ 42	95.23%	40/ 42	95.23%
SS,LT	43	17/ 43	58.13%	40/ 43	93.02%	41/ 43	95.34%
LS,ST	46	8/46	17.39%	22/ 46	47.82%	43/ 46	93.47%
LS,LT	49	5/49	12.24%	22/ 49	44.90%	42/ 49	85.71%
Total	180	69/ 180	38.33%	124/ 180	68.89%	166/ 180	92.22%

Conclusion

Definitions and datasets are prepared as follows

Item	Occlusion times(counts)			
Large size(LS) 350 - 600pixels	95	Long term(LT) >3s	92	
Small size(SS) <280pixels	85	Short term(ST) <3s	88	

 With our proposed method, success rate reaches more than 92%

