OCCLUSION AWARE MULTIPLE TARGET
PARTICLE FILTER TRACKER

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INTRODUCTION

RESULTS (SINGLE TARGET)

PARTICLE FILTER TRACKERS

PROPOSED METHOD

- Occlusion Flag: Switching Sampling and Motion Model based on Occlusion State
- Introducing Occlusion Flag (Z) to Representation
  - Occlusion Case ⇒ Uniform Distribution
  - No Occlusion Case ⇒ Feature Level Template Match
- Resampling uses a state transition model to probabilistically detect occlusions.
- Occlusion Estimation
- Target Localization using Non-occluded Particles

Flowchart of Occlusion Aware PFT

Occlusion Estimation

Occlusion Threshold

Model Update

Resampling

FEATURES

- Depth
- Edge
- Texture
- Gradient
- Shape
- Color

2D Prof.

B (Proposed)

OCCUPATION

SURVEILLANCE

PUBLIC

ENTERTAINMENT

ROBOTICS

MEDICAL

ACTION RECOGNITION

CHALLENGES

Abrupt Motion

Illumination

Occlusion

Non-Rigid

Cluster

Varying Scale

DIVERSITY

TRACKING APPLICATIONS

Robotics

Medical

Action Recog.

INTRODUCTION

RESULTS (SINGLE TARGET)

MULTI TARGET EXPANSION

- Multi modal presentation of particle filter (TBD)

CONCLUSIONS

- Detect Occlusion
- Recover after Occlusion Quickly
- Handles Abrupt Motion Changes
- Expands Search Area if Occlusion Persists

Occlusion Flag

Channel Fusion

- Performance of the Fusion is Better than Each Channel Alone
- Handle Illumination Changes

REFERENCES