Implementation of Hybrid Model of Particle Filter and Kalman Filter based Real-Time Tracking for handling Occlusion on Beagleboard-xM

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Abstract

Particle filter is considered as one of the most robust and accurate techniques in object tracking because of its capability to handle non-linear and non-Gaussian problems. However this technique fails whenever the tracked object is occluded by other objects. In order to solve this problem, in this paper, we have proposed a computer vision based target tracking algorithm that combines both particle filter and Kalman filter. When the target is visible, particle filter is used for tracking the target but whenever there is occlusion, Kalman filter is used to predict and estimate the state of the occluded target. Hence, the proposed algorithm provides accurate results during both visible and occluded conditions. In order to verify the validity and
effectiveness of the proposed algorithm, implementation on BeagleBoard-xM, an ARM based embedded platform, has been done. Integration of tracking algorithm on embedded platform paves the way for many real world applications like automated surveillance, human computer interaction, robotics, traffic monitoring etc.

References

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- Simple Directmedia Layer (SDL) – http://www.libsdl.org/

Index Terms

Computer Science  Information Sciences
Keywords

ARM  BeagleBoard-xM  Distance Measures  Embedded Computer Vision
Gstreamer
Kalman Filter
Particle filters
Re-Sampling
SDL
Target Tracking.