

# Multi-Object Tracker Using Kernelized Correlation Filter Based on Appearance and Motion Model

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**Abstract**—The objective of this study is to determine a tracking method using kernelized correlation filter based on object's appearance and motion model used to track multi-object. This system largely consists of 4 modules: motion model, background subtraction, hijacking handling and occlusion handling. Lab colour model is applied to subtract background, and histogram of oriented gradient (HoG) is used to extract object feature. If occlusion among objects occurs, we use a method that tracks again after removing the overlapping objects in consideration of the depth between objects: The head of the closer object is being taken from a camera positioned below the head of the distant object. Thus, among occluded tracking objects, we find that the most upper located object is considered as the furthest object in captured camera image. If hijacking among objects is occurred, it has been solved by removing the overlapping region of the bounding box between two objects that maintain their relative positions for a period of time. These results indicate that this method may allow a solution for tracking of multi-object to be more robust to real-world tracking environments.

**Keyword**—Multi-object tracker, Background subtraction, Kernelized correlation filter, Occlusion handling, Hijacking handling



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