**ARAB ACADEMY FOR SCIENCE, TECHNOLOGY
AND MARITIME TRANSPORT
(AASTMT)**

College of Engineering and Technology

Department of Computer Engineering

A 3D Trajectory Signature Identification for Human-Computer Interaction (HCI) Applications

By

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ABSTRACT

With the importance of tracking and the huge challenging in computer vision applications, tracking becoming the most important research nowadays. Mainly, tracking is used to keep track of objects. Tracking has many applications such as surveillance, vehicle navigation, and autonomous robot navigation. Tracking control is used to affect desired trajectories of a device, human and anything can move. Track specified trajectories, or is able to follow more general trajectories. Many tracking control algorithms have been proposed. Motion trajectory contains plentiful motion information of moving objects, for example, human gestures and robot actions, but still there are some problems of tracking trajectory in its application. In this thesis, a new model for 3D trajectory signature tracking is proposed that integrates the maximally stability extremal region (MSER) feature extraction of first level transformed domain descriptors with K- nearest neighbour classifier. The main phases of the proposed system include: encoding phase, build component tree, extract maximally stability extremal regions, and finally, the similarity matching using k-NN classifier. Experiments have been carried out on large datasets of tracking trajectories with different characteristics. MATLAB software version R2011a is used to implement and test the proposed method. Experiments have been carried out to validate the efficiency of the proposed model. Experiments are applied on various size of test dataset. Experimental results showed that the proposed model produces satisfactory performance. Significant improvements have been illustrated in terms of recognition accuracy and recognition performance with respect to the previous works in the same filed.