Automatic Zooming Mechanism for Capturing High Object Image Using High Definition Fixed Camera

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***Abstract*—High definition (HD) camera is widely used in surveillance systems. An HD camera with optical zoom is useful for monitoring a large area. However, it is inconvenient for a user to manually control the optical zoom for a long time. To exploit the functionality and extend the application domains of a HD camera, the zooming should be controlled automatically. An automatic zooming mechanism is proposed in this paper. When an object moves through the field of view (FOV) of the camera, the zoom is controlled for capturing the object as clear as possible. In order to achieve the above goal, a Gaussian Mixture Model (GMM), temporal image differencing, a CamShift tracking method, and a Kalman filter are utilized for object detection and tracking. Then, an adaptive neuro-fuzzy inference system (ANFIS) is used to learn and determine a suitable value for adjusting the zoom. According to the experimental study of the prototype, the results show that the proposed mechanism is useful to capture the clear images of moving objects in a practical environment.**

***Keywords*—Object tracking, Surveillance system, Intelligent video surveillance, Neural network**

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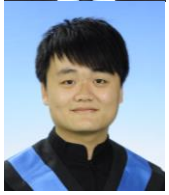

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