

Pre-trained Deep Convolutional Neural Networks and Context Mining for Video Anomaly Detection

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Abstract

The ability of intelligent surveillance systems to detect potentially harmful behavior in a timely way necessitates the detection of anomalies as a vital first step. Many approaches to video anomaly detection utilizing deep learning algorithms concentrate on a single camera's video stream with a predetermined scenario as their primary focus. These deep learning approaches make use of training material that is extensive in scale and complicated in nature. In this paper, we show how to use pre-trained convolutional neural net models to perform feature extraction and context mining. After that, we use an autoencoder for denoising with a model that isn't too complicated to quickly and accurately find surveillance anomalies. This solution can be helpful for resource-constrained devices such as edge devices of the Internet of Things (IoT), which are examples of IoT devices. The judgments that our anomaly detection model makes are dependent on the high-level features that are derived from the embedded computer vision models that we have chosen. These models include object identification and object classification. In addition, in order to further improve the overall effectiveness of our system for detecting anomalies in video data, we infer contextual attributes from high-level features. We use two datasets from UCSD to demonstrate that our method, which has a relatively modest level of model complexity, can achieve comparable levels of performance when compared to the methods that are currently considered state-of-the-art.

(Keywords:)

Security , video surveillance , anomaly video analysis , abnormal event detection , deep features , context mining

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