

# Anomaly detection in video used for surveillance

## Background

In a large video surveillance setup, there can easily be thousands of cameras. Constantly monitoring all this video for suspicious behavior is a very resource-consuming task. In some setups, it is however mission critical that this is done. It could for instance be needed in order for a guard to be able to take action on an incident with as little delay as possible.

To limit the resources needed to do this monitoring, it would be helpful if the video surveillance system itself, by analyzing the video, could somehow generate a warning if something suspicious or at least abnormal is happening. This will allow a lot less video to be monitored; only when a warning is generated, will a guard look at the video.

The system will of course need some initial training in order to understand what is normal and what is not. In addition, it would be okay if the guard receiving the warning can communicate back to the system whether it was actually an abnormality or not. In this way, the system can learn over time and improve on the quality of the warnings given.

## The project

In this project, we want to investigate how to make an algorithm that can detect abnormalities in a video feed. The algorithm should be able to learn from both offline and online video what is normal and what is not. If a false positive is generated, the user should also be able to communicate back to the algorithm that this was actually normal behavior so that the same false positive is not generated again.

The algorithm must be able to consider time when doing the detection. What is normal on a Monday might for instance not be normal on a Friday. In addition, the algorithm should be able to cope with changing weather and seasons.

It is important that the algorithm is fast since it needs to run on all camera feeds. The more resources it requires, the more hardware needs to be bought and the less attractive the feature will be to our customers.

It is expected that a standalone prototype of the proposed algorithm is implemented that shows how abnormalities can be detected. An analysis of how robust the algorithm is and how it performs, is expected.

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