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Scientific Project Proposal for International Exchange Student

Topic: **Deep Learning for rare events detection**

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Laboratory: PRISME, Orleans
Internship period: From January 15th till May 2019

Abstract

Rare events detection in a video is a hot topic in computer vision and interesting for the society. Monitoring a crowd of people in a public area, in order to ensure the security, is a big challenge for leaders. Robust and advances algorithms are used to help security agents in that task. One could use computer vision algorithms to detect any rare behavior of people in the monitored environment.

Recent development in computer vision shows the high performance of deep learning methods for many applications. However, in the context of events detection, only a few works [1] focus on apply deep learning algorithms to improve the state of art. Most of the published works [2][3] used the traditional method based on optical flow and appearance combine with machine learning algorithms for that purpose.

During this internship, we would like to use the most recent deep learning algorithms to detect rare events in the video. Such an algorithm, need a huge number of data to perform well. Since for rare events detection task, the available datasets are small, we will try to use different recent technics such as augmented data to overcome the problem of available data.

Required skills: python, Matlab, basic notion in computer vision

Bibliography

[1] Feng, Yachuang, Yuan Yuan, and Xiaoqiang Lu. "Learning deep event models for crowd anomaly detection." Neurocomputing 219 (2017): 548-556.
[2] Singh, Dinesh, and C. Krishna Mohan. "Graph formulation of video activities for abnormal activity recognition." Pattern Recognition 65 (2017): 265-272.
[3] Li, Ang, et al. "Abnormal event detection based on sparse reconstruction in crowded scenes." Acoustics, Speech and Signal Processing (ICASSP), 2016 IEEE International Conference on. IEEE, 2016.