Learning and transferring movie styles

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Context

There is currently a lot of interest in analyzing large movie databases to automatically extract film style and aesthetics [1,2]. This analysis has, however, been largely limited to identifying the duration, size, color and motion of movie shots. While these low-level details are pertinent, they do not provide a high-level understanding of cinematography, such as identifying the inherent style in a movie. Ultimately, they are unable to answer challenging questions such as, *can we identify the author of a movie clip*? *Can we generative movie shots in the style of a given director or cinematographer ? can we generate shot sequences on the style of a given director or film editor ?*

Objectives

The goal of this thesis will be to study the problem of attributing authorship of motion pictures, by learning models of famous directors, cinematographers and film editors in an existing dataset of Hollywood movies [3]. We will build on recent work by Thomas and Kovashka [4], who proposed a method for identifying authorship in a collection of photographs and generating new collages in the same style.

Specifically, we will extend their method to the case of movies, with the corresponding goals of identifying the three main authors of a movie – its director, cinematographer and film editor – and generating new movies replicating their respective styles. This will be cast as a supervised **image set classification** problem, taking advantage of recent advances in object detection [5] and human pose estimation [6] to learn the spatial and temporal statistics of image content and composition in movies.

Requirements

The student must have solid programming skills. Prior knowledge of machine learning tools (e.g., TensorFlow, Torch, Theano, Keras) is a big plus.

References

[1] http://www.cinemetrics.lv
[2] B. Salt, Film Style and Technology: History and Analysis, Starword, 2009.
[3] J. E. Cutting, J. E. DeLong and C. E. Nothelfer, Attention and the evolution of Hollywood film, Psychological Science, vol. 21, pp. 440-447, 2010.
[4] C. Thomas, A. Kovashka, Seeing Behind the Camera: Identifying the Authorship of a Photograph, CVPR 2016.
[5] Joseph Redmon, Santosh Divvala, Ross Girshick, Ali Farhadi. You Only Look Once: Unified, Real-Time Object Detection. CVPR 2016.
[6] Zhe Cao, Tomas Simon, Shih-En Wei, Yaser Sheikh. Realtime Multi-Person 2D Pose Estimation using Part Affinity Fields. CVPR 2017.