QUESTION

How can i use the speed and efficiency of machine learning to create a prototyping feature in video editing tool for real-time compositing?

SHORT DESCRIPTION (1 SENTENCE)

My project is specifically designed to tackle the task of extracting salient moving objects from a video with non-trivial background and then adding the resulting layer onto any given video footages to implement an automate and accurate video compositing tool.

LONG DESCRIPTION (750 Words)

"Many of the features offered by video editing software, for instance, reference the preceding vocabulary of flatbed film editors. Though these references were helpful in transitioning a generation of filmmakers to a digital workflow, they did little to uncover new possibilities within the emerging medium of video. Discovering the unique possibilities of a medium requires experimentation... It is here that designers will prove essential to the future of machine learning." - Machine Learning for Designers by Patrick Hebron.

I started my project by asking myself a question of how machine learning can be utilized to help address new possibilities in digital content editing and enhance the design experience, specifically making choices for designers in realtime, allowing them to test out and prototype with various semantic objects in their workflow. I want to develop a tool that can easily be learned by machine brains that will be able to facilitate the change of semantic objects within digital content for real world design workflow.

Most video editing tool today provide features to modify objects in video frame by frame based on pixel-level recognition. It is work-intensive and inefficient. The reason for that is that this type of work naturally lies in the post-production stage, aimed at the end product. However, with artists nowadays empowered with technology that has more speed, options and efficiency, this current process is antiquated and leaves little opportunity for quick prototyping and testing in the early stages of production, therefore limiting the creativity of video makers.

What I have explored is a way to bring the workflow normally found in the final stages of the editing process, closer to the production stage, allowing creators to composite different raw video footages together without having to pre-arrange the video shooting within a specific environment, such as in front of green screen color background, or any background hold static information.

In depth, this is a prototyping tool that provides an alternative approach that traditional video compositing feature found in professional video editing tools(Final Cut pro, Adobe Premiere, AfterEffect) provide but under certain limitation prior in the editing process. My program deploys a salient object detection framework—deepSaliency, developed by LIiming Zhao (http://

www.zhaoliming.net/research/deepsaliency) to perform accurate subject detection and treat the results as foreground objects and composite them with other background videos. This dynamic detection capacity on raw video footage sources omits the requirement of having to set up static background for contracting the moving foreground objects and further extraction process.

With the goal in mind, my project aims to hep avoid the delay of some necessary prototyping. Artists would be able to shooting different subjects and exploring around different scene settings more freely, and oftentimes the best artwork comes out of unsupervised experiments.