Creating Summaries from User Videos - Supplementary Material

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In this document we give an overview over the contents of the supplementary material. Furthermore we show the interface for the video summarization study.

1 Feature weights

In Fig. 1 we show the feature weights that were learnt by our model.

2 Videosummarization results

We show an overview of our summarization results in the video 'Summarization_Results'. In addition, there exists a folder for each video from our dataset, containing:

i) Performance plots
ii) The selection of the human study subjects
iii) Autmatic summary selection
iv) Summaries created with our method

3 SumMe Dataset: User study

Here, we describe the setup of the study in more detail. It was set up as follows: Participants were instructed with the task of creating a summary. The instructions are given in Fig. 3. In order to ensure that the study subjects selected a summary without bias, no other instructions were given. Instead, we empathized that the subjects should create a summary based on what they personally viewed as important. Furthermore they fulfilled the task unwatched.

3.1 Interface

The interface was created and optimized particularly for the task of selecting video summaries. It is shown in Fig. 2. We configured the interface such that it assisted the study subjects to create a summary. During the first run, the video was shown completely and it could not be skipped. Then, the study subjects

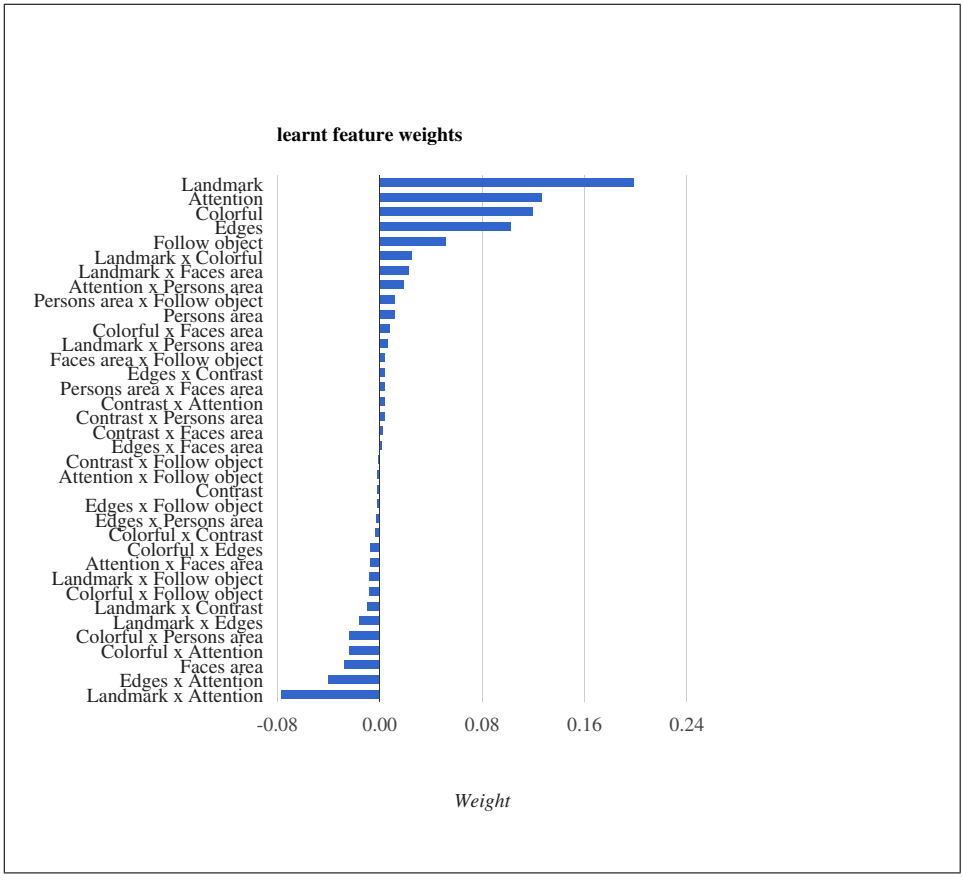

Fig. 1: The feature weights learnt by our model.

could select segments, modify them and watch the summary. We set a hard restriction on the summary length, such that it is between 5% and 15%. As a guidance, the summary length of the current selection was shown in the top right corner (See Fig. 2). By iterative refining, the study subjects could then create a summary that is optimal in terms of contents, while meeting the restrictions of the summary length. The videos were shown in random order and the audio track was not included.

3.2 Videos and participants

The *SumMe* dataset consists of 25 videos covering holidays, events and sports. They are mostly raw or weakly edited user videos, downloaded from YouTube[4]. We focus on such videos, as they are produced in such great quantities nowadays

[4] https://www.youtube.com

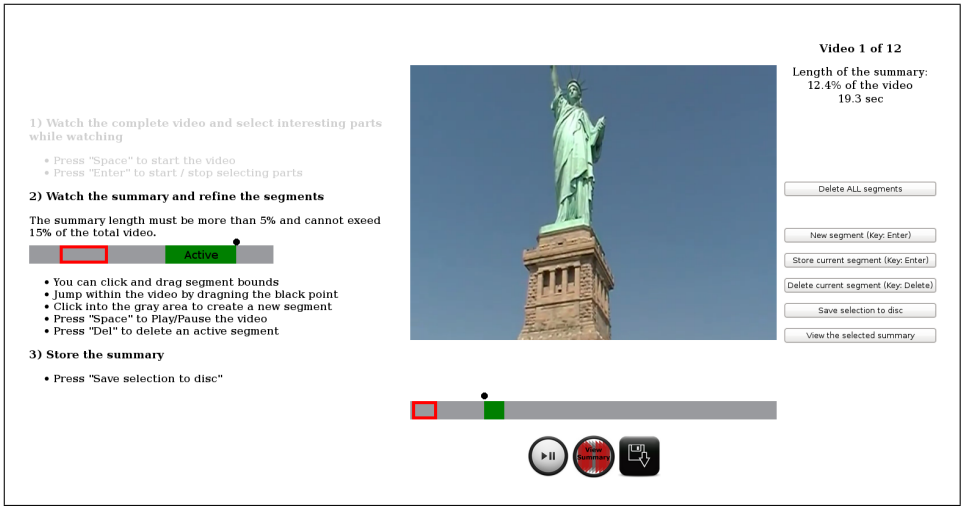

Fig. 2: The interface we used for the study.

and have a high compressibility compared to already edited videos. The length of the videos ranges from about 1 to 6 minutes, which reflects the typical lengths of videos on YouTube.

In total 19 male and 22 female subjects conducted the study. Their ages range from 19 to 39 and all had normal or corrected vision. Each study subject annotated videos for a maximum time of one hour and each video was annotated from 15 to 18 different people. As a comparison [2] used 10, while [1] used 5 for generating keyframe selection ground truth.

References

1. Sandra E. F. de Avila, Ana P. B. Lopes, Antonio da Luz Jr., and Arnaldo de A. Arajo. VSUMM: a mechanism designed to produce static video summaries and a novel evaluation method. *Pattern Recognition Letters*, 2011.
2. Aditya Khosla, Raffay Hamid, CJ Lin, and Neel Sundaresan. Large-Scale Video Summarization Using Web-Image Priors. *CVPR*, 2013.

Instructions

The goal of this study is to investigate what video parts are important and therefore should be in a summary.

Your task is to watch a set of videos and to select the parts that **best characterize/summarize the video**. For each video, please perform the following steps:

1. ***Watch the video completely and select,*** at the same time***, parts*** that you consider important/interesting.
2. ***Refine the selected parts*** by dragging the start or end of a segment.
3. ***Watch the created summary***
4. If needed, make further changes
5. ***Save*** the summary. The next video will be shown

If there are questions, please feel free to ask the study instructor.

Fig. 3: The instructions as given to the study participants.