

Video Summarization via Crowdsourcing

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Goals

- Generate satisfactory video summaries for all video types through a lightweight method
- Generate different abstract levels of video summary according to viewers' preferences

Concepts

- Leverage the wisdom of crowds to generate video summaries
- Viewers click the SPACE key whenever they feel that the video at this moment should be included in its trailer

Experiment Instructions

- 1 Watch and Click**
During this study, you need to complete 3 tasks. In each task, a video clip will be played 2 times.
Please watch each video carefully from the beginning to the end.
Whenever the video reaches its highlights, please press SPACE key on your keyboard.
- 2 How to determine Video Highlights?**
Imagine that you are a director and editing a trailer for a video clip, the video frames or segments that you perceive worth to be included in the trailer are called Video Highlights.
- 3 How to determine Video Highlights? (Cont.)**
Each Video Highlight can be instantaneous or spanning a period of time.
- If it is instantaneous, click SPACE key and release it immediately.
- If it spans a period of time, press SPACE key and only release it until the end of the highlight.
- 4 Watch and Click - Example**
When SPACE key is pressed, the color of the border of the video player will be changed from WHITE to RED. It will be back to normal when SPACE key is released.

Summary Generating Algorithm

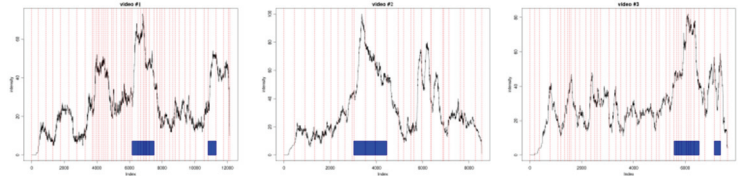
- video clip: n non-overlapped video shots
- t : timestamp
- collected k click-action samples: t_1, t_2, \dots, t_k
- viewer-preferred summary length: T

```
compute the histogram,  $H$ , of  $t_1, t_2, \dots, t_k$ 
summary = {}
while video length(summary) < T do
   $t_{add} = \arg \max_t H(t)$ 
   $shot_{add} = \text{the video shot containing } t_{add}$ 
  summary = summary union  $shot_{add}$ 
end
```

- output: **summary** (set of video shots)

Generated Summary Segments

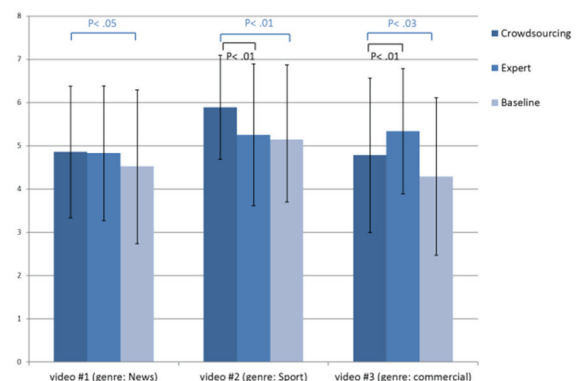
- Summary segments (blue-marked) generated from the collected samples (661 raw data)



Evaluation

- Within-subjects user study (N=81)
- 3 genres of video source: News, Sport, Commercial
- Rating video summaries generated from our method (**crowdsourcing**), **experts**, **subsampling**
- “Please rate the summary segments that you just watched, based on how good in helping you make sense of the full video”

Result



Future Work

- Prepare for a wider-scale deployment of this framework
- Increase the data sets of video source for more general evaluation
- Investigate how to encourage users to participate in video summarization with non-monetary reward