

## Multimedia Analysis and Indexing – Fall 2015

### HW#1 (DUE: noon, Tuesday, 10/20, 2015)

Note:

- 1) If you have any questions regarding the homework, send e-mail to the TA at kuonini@gmail.com.
- 2) Submit a soft copy of your write-up (in PDF) and programs to TA **before the due**. The mail subject should start with “[mmmai\_hw1].”
- 3) Videos and dumped frames are available at the course website. Please **DO NOT** distribute the test videos.
- 4) You are highly encouraged to write the homework in English.
- 5) Please **DO** write appropriate comments along with your codes.

**a) Shot detection.** Various shot boundary detection algorithms have been described in the lecture. Several survey papers are available at the class website. Please read at least one of the papers (or other relevant publications) and then choose one algorithm that you will use in the following experiments. You can write the program in the language of your choice.

Please write a brief summary (no more than 2 pages) of the algorithm you choose and explain the reason of your specific choice and also mention the paper you refer to. The reason could be the simplicity of the algorithm, its flexibility, or the matching with the test video data provided in this homework, etc. Please review the following five homework videos and fill in the possible transition types you observed. Which color space (e.g., RGB, YIQ, HSV) do you choose? Why? Does your shot detection program work well on all the videos?

#	Genre	Transition Types	Frame Counts	Average Shot Length (Frame)	
01	News	Cut	829	63.8	
02	Trailer	Fade in + Fade out + Dissolve	751	53.6	
03	Ad		1,480	26.4	
04	Anime		776	15.2	25
05	Opening Credits		1,230	10	20.2

**b) Video summarization.** Please utilize your shot detection program (or modified one) to detect the shot and identify the keyframes (e.g., the middle one within each shot) and then summarize for the following two egocentric videos—[06.mpg: 1,351 frame (54s) & 07.mpg: 751 frames (30s)]. The results are very similar to those in Figure 3 of reference [1]. You can follow the reference papers (e.g., [1, 2]) or design a simplified version for the video summarization. Please briefly describe your approach (e.g., keyframe selection, layout) and show the results in the writing.

### [References]

- [1] S. Uchihashi and J. Foote, "Summarizing Video Using a Shot Importance Measure and a Frame-Packing Algorithm," ICASSP 1999.
- [2] Yu-Ming Hsu, Ming-Kuang Tsai, Yen-Liang Lin, Winston Hsu, "Comp2Watch: Enhancing the Mobile Video Browsing Experience," ACM Multimedia 2011 Workshop on Interactive Multimedia on Mobile and Portable Devices (IMMPD 2011).