Making effective navigation for online education videos
Making online videos interactive

Input style: classroom lecture, powerpoint lectures, Khan Academy style

- Different styles may require different edits/techinques for naviagtion. Personally, I think classroom lecture ≥ Khan Academy style ≥ powerpoint slide lectures in order of difficulty to navigate.

- Several works([3], [4]) suggest that different styles are preferred for different purposes. Also interesting is the idea of **converting from one style of video to other**.

Input content: general vs. select subject

- Choosing a specific subject may be more important for adding interactivity, participatory material

Random Ideas

- Navigation of visual content

  - Segmenting videos into meaningful *chapters*
  - Creating static *key frames* out of continuous lectures
  - Linking related parts of videos
  - Creating various length trailers (e.g. 1min, 3min, 10min versions), or summary slides (e.g. 1p, 10p summary notes etc.)
  - We can think about how much to automate/or develop tools that make it easier for users to add any these functions

- Navigation of audio content

  - optimizing audio fastforwarding silent periods, unnecessary content etc.
  - making searching with audio content easier
  - for content creation and editing: syncing with visual content
  - what would be an equivalent of *key frames for audio*?

- Introducing student interaction

  - I liked Fredo's idea about collecting student output and clustering/visualizing them for the instructor. I think this could provide insight into further steps of providing feedback etc.
  - A related idea is a system to share responses betweens students. Both require some way to cluster and visualize large and varied data from students.
  - Where and it what form to introduce interaction: hiding parts of contents, letting students finish parts of contents etc.

Bibliography

[1] Richard Anderson, Ruth Anderson, Beth Simon, Steven A. Wolfman, Tammy VanDeGrift, and Ken Yasuhara. Experiences with a tablet pc based lecture presentation system in computer science courses. In *Proceedings of the 35th SIGCSE Technical Symposium on Computer Science Education*, SIGCSE '04, pages 56–60, New York, NY, USA, 2004. ACM.

[2] Pei-Yu Chi, Sally Ahn, Amanda Ren, Mira Dontcheva, Wilmot Li, and Björn Hartmann. Mixt: Automatic generation of step-by-step mixed media tutorials. In *Proceedings of the 25th Annual ACM Symposium on User Interface Software and Technology*, UIST '12, pages 93–102, New York, NY, USA, 2012. ACM.

[3] Andrew Cross, Mydhili Bayyapunedi, Edward Cutrell, Anant Agarwal, and William Thies. Typerighting: combining the benefits of handwriting and typeface in online educational videos. In *CHI*, pages 793–796, 2013.

[4] Andrew Cross, Mydhili Bayyapunedi, Dilip Ravindran, Edward Cutrell, and William Thies. Vidwiki: enabling the crowd to improve the legibility of online educational videos. In *CSCW*, pages 1167–1175, 2014.

[5] Richard C. Davis, Brien Colwell, and James A. Landay. K-sketch: A 'kinetic' sketch pad for novice animators. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '08, pages 413–422, New York, NY, USA, 2008. ACM.

[6] Philip J. Guo, Juho Kim, and Rob Rubin. How video production affects student engagement: An empirical study of MOOC videos. In *Proceedings of the ACM Conference on Learning at Scale*, L@S '14, New York, NY, USA, 2014. ACM.

[7] Juho Kim, Philip Guo, Daniel Seaton, Piotr Mitros, Krzysztof Gajos, and Robert Miller. Understanding in-video dropouts and interaction peakes in online lecture videos. In *Learning at Scale (To Appear)*, 2014.

[8] Sharon Oviatt, Rebecca Lunsford, and Rachel Coulston. Individual differences in multimodal integration patterns: What are they and why do they exist. In *Proc. CHI05*, pages 241–249, 2005.

[9] James A. Schnepf, Yen-Jen Lee, David H.C. Du, Lan Lai, and Liang wei Kang. Building a framework for flexible interactive presentations. In *Proceedings of Pacific Workshop on Distriubted Multimedia Systems, Hong Kong*, 1996.

[10] Bin Yu, Wei-Ying Ma, Klara Nahrstedt, and Hong-Jiang Zhang. Video summarization based on user log enhanced link analysis. In *Proceedings of the Eleventh ACM International Conference on Multimedia*, MULTIMEDIA '03, pages 382–391, New York, NY, USA, 2003. ACM.