Are There Better Ways to Teach and Learn with Video?

Matthew Fong*, Gregor Miller*, Xueqin Zhang*, Ido Roll†, Sarah Perez†, Christina Hendricks‡, Luis Linares*, Sidney Fels*

*Department of Electrical and Computer Engineering,†Centre for Teaching, Learning, and Technology, ‡Department of Philosophy

How is video used in education?

A plethora of instructional videos across many topics can be found on streaming video sites like YouTube. Recently, video has been making its way into classrooms, and with the development of online self-learning frameworks such as edX and Coursera, commonly referred to as MOOCs (Massively Open Online Courses) learning from video is becoming more prevalent. With the success of video in education, instructors are beginning to use video in their teaching, and in the case of *flipped classrooms*, using video as a replacement for lectures.

What are we investigating?

- How do students study from video?
- What can we do to aid studying using existing habits?
- How do we create and evaluate a new video tool to meet student and instructor needs?

What did we do?

- conducted interviews to find out how students study using video
- developed an interface, inspired by traditional textbooks and methods for annotating textbooks
- investigated how users watched course videos and how they used the textbook inspired annotating tools
- conducted interviews to find out how users were using the interface
- deployed the interface across 3 classes

Related Work

While video as an educational platform is fairly new, there are a couple systems developed with learning in mind.

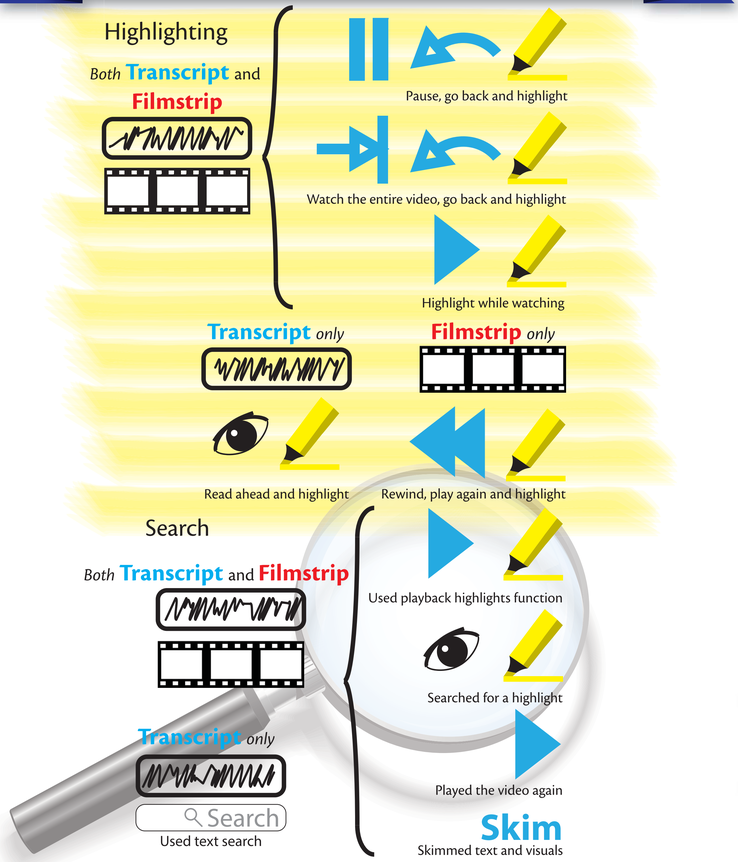
CLAS, or Collaborative Learning Annotation System, allows students and teachers alike to comment on specific points of a video online and provides a forum for discussion visually centred around the video.

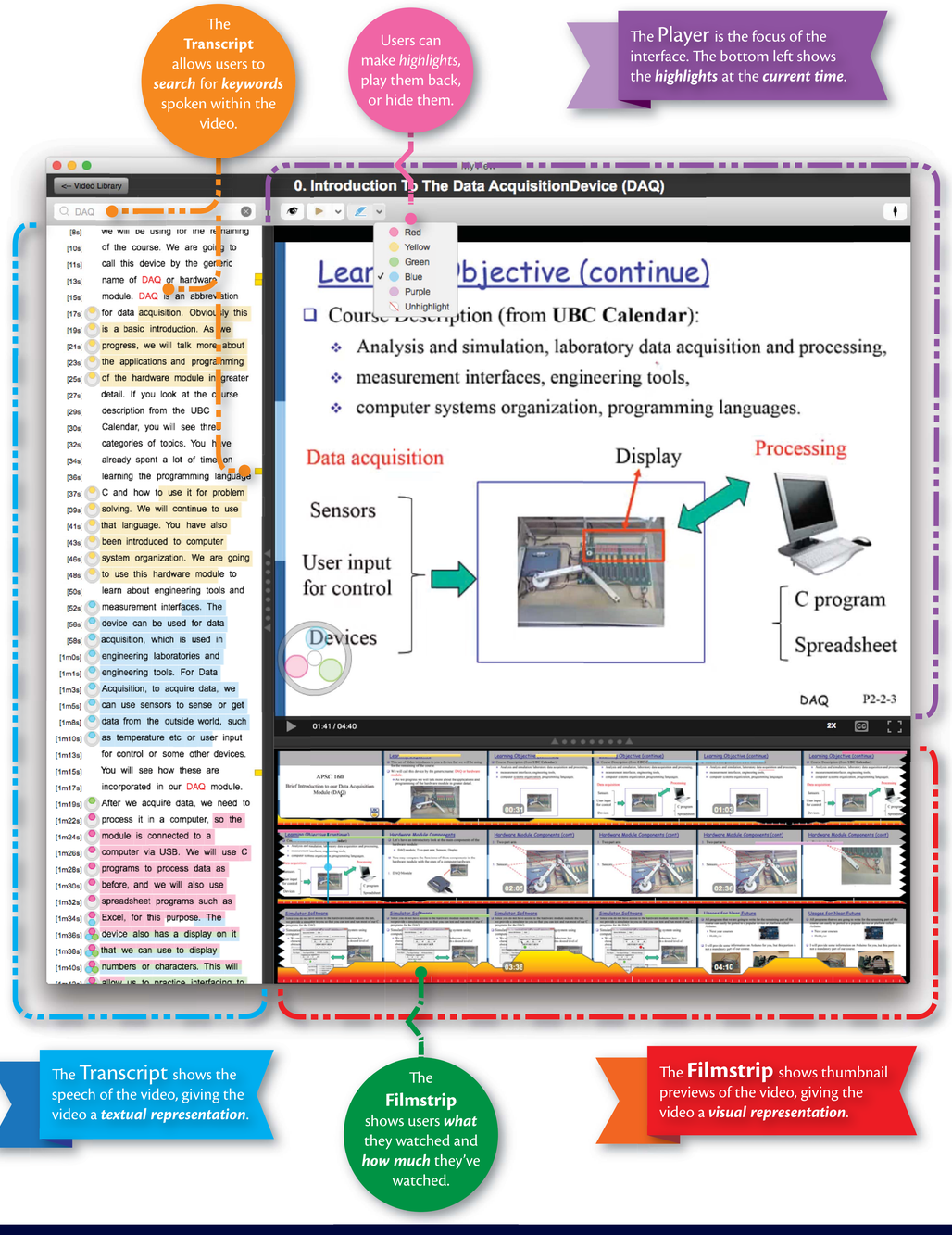
L.IVE (Monserrat *et al.*, 2014) which provided students with the ability to discuss parts of the video with temporal comments (marked at a single time in the video), along with assessments included with the video.

RIMES (Kim *et al.* 2015) uses interactive multimedia exercises within lecture videos, with students giving feedback in video, audio and sketches. Videos contain exercises, and annotations available for students to answer questions.

How do we leverage these types of interfaces to allow students to study from video in ways that they are used to?

How did students work with video?



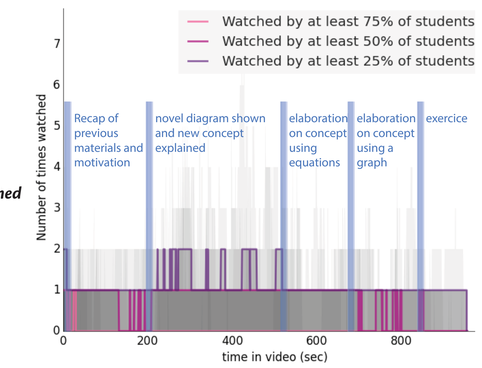


How did students watch video?

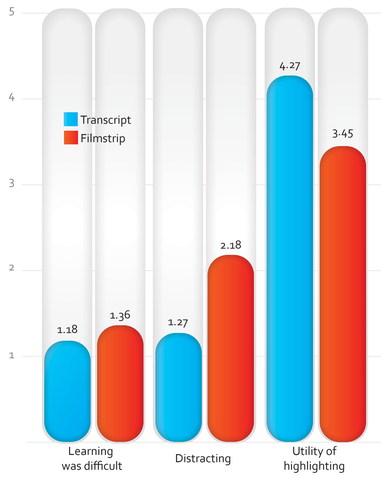
Students will watch videos differently:

- watch very little of the video
- watch portions of the video
- watch the whole lecture
- watch the whole lecture and rewatch it

Group by percent rewatched	Groups by percent watched: less than 5%	5% to 95%	more than 95%
didn't rewatch	136	69	59
rewatched at least 10%	12	29	20
rewatched between 10% and 100%		23	58
rewatched more than video length		2	17



- changes in ***lecture content*** matched changes in ***viewing***.
- new concepts were ***rewatched*** by at least 25% of students.



- the interface scored high on general appeal
  - easy to use - 4.18/5
  - powerful - 4.27/5
  - flexible - 4.09/5
  - aesthetically pleasing - 3.82/5
- participants preferred to use the **Transcript** to highlight (Friedman Test, $\chi^2 = 11.000$, $p = 0.001$, $df = 1$)
- the **Transcript** was ***significantly*** less distracting while watching a video (t-test, $t = 0.045$, $df = 11$)
- participants found both *easy to use* and both had useful highlighting functions
- the **Filmstrip** was *distracting* because of the large playhead moving across
- the **Transcript** was mildly *distracting* because of the large amount of text

Conclusions

In the context of educational videos, we can conclude that videos that include transcripts offer more utility for users and will allow them to highlight, search, and review the video more easily. Assessing student interaction revealed both individual patterns and content driven collective patterns, a preference for visual navigation, and an adaption of viewing behaviour given a personalizable textbook inspired interface across three courses.

a place of mind

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