Geza Kovacs Stanford University

1. How can online lectures be improved?

- Eliminate the need to seek to and from in-video quizzes
 In-video quizzes are the most common seek destination in Coursera lectures
 Users often skip forward to quizzes, or from one quiz to the next
- Increase emphasis on testing and review
 Repeated testing and spaced review improves retention
 However, MOOC users primarily watch videos, don't do problems or exams
 Only 11% of users who finish watching a lecture ever open it again

2. QuizCram: Question-Driven Video Viewing

- Shows a question associated with each part of the video If you know the answer, answer question to navigate to the next section
- Review using a timeline of past questions and videos
 Can refer back to past questions, or resume watching a previous video
- Keeps track of seen parts and suggests parts to review
 Suggestions based on past performance, parts seen and recency of review
- Can be automatically generated from in-video quizzes
 Can also add additional questions for a more quiz-driven experience

3. User Study: QuizCram vs In-Video Quizzes

- Within-subjects design with 18 participants over 2 days
- Materials from Neurobiology course on Coursera 2 parts, each with 5 videos, 9 in-video quizzes, and unit exam







Progressbar shows seen parts of video and parts relevant to the question



Timeline of past videos and questions allows easy navigation and review

4. Study Procedure

Pumping blood through the circulatory system

Correct Voluntary movements are self-generated actions dri

Day 1: Study both sets of videos for 40 minutes, one with each tool Day 2: Take a set of exams on the studied materials

Unit exams, in-video guizzes, extra multiple-checkbox and free-response guestions

5. Results: improved retention on in-video questions and more reviewing with QuizCram

Exam scores showed improved retention on in-video questions

Exam	QuizCram	In-Video	Statistically significant?
Original in-video questions	85.4%	81.3%	Yes (t=2.24, p=0.039)
Original unit exam	65.1%	63.4%	No (t=0.44, p=0.669)
Extra multiple-checkbox questions	85.5%	76.0%	Yes (t=2.44, p=0.026)
Extra free-response questions	67.6%	49.0%	Yes (t=3.95, p=0.001)

Users answered and reviewed each question more times when using QuizCram

QuizCram	In-Video	Statistically Significant?
22.3	13.5	Yes (t=3.22, p=0.008)
13.8 (62%)	5.3 (40%)	Yes (t=4.62, p=0.0007)
9	0.17	Yes (t=5.00, p=0.0004)
7.2	11.9	No (t=-0.82, p=0.43)
	22.3 13.8 (62%) 9	22.3 13.5 13.8 (62%) 5.3 (40%) 9 0.17