Interaction Peaks and Data-Driven Interfaces for Online Lecture Videos

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Understanding In-Video Dropouts and Interaction Peaks in Online Lecture Videos.

Video interaction data from MOOCs

Motivation: How do students learn from videos on Massive Open Online Courses (MOOCs)? We analyze **video interaction data** (pause, play, scrubbing).

Dataset: interaction log from 4 edX courses in Fall 2012

| Course	Subject	University	Students	Videos	Video Length	Processed Events
6.00x	Intro. CS & Programming	MIT	59,126	141	7:40	4,491,648
PH207x	Statistics for Public Health	Harvard	30,742	301	10:48	15,832,069
CS188.1x	Artificial Intelligence	Berkeley	22,690	149	4:45	14,174,203
3.091x	Solid State Chemistry	MIT	15,281	271	6:19	4,821,837
Total			**127,839**	**862**	**7:46**	**39,319,757**

Video dropout analysis

Video dropout: percentage of students navigating away from a video before completion

Overall dropout rate: 55.2% (36.6% within the first 3%)

Longer videos have a higher dropout rate.

Re-watching sessions have a higher dropout rate.
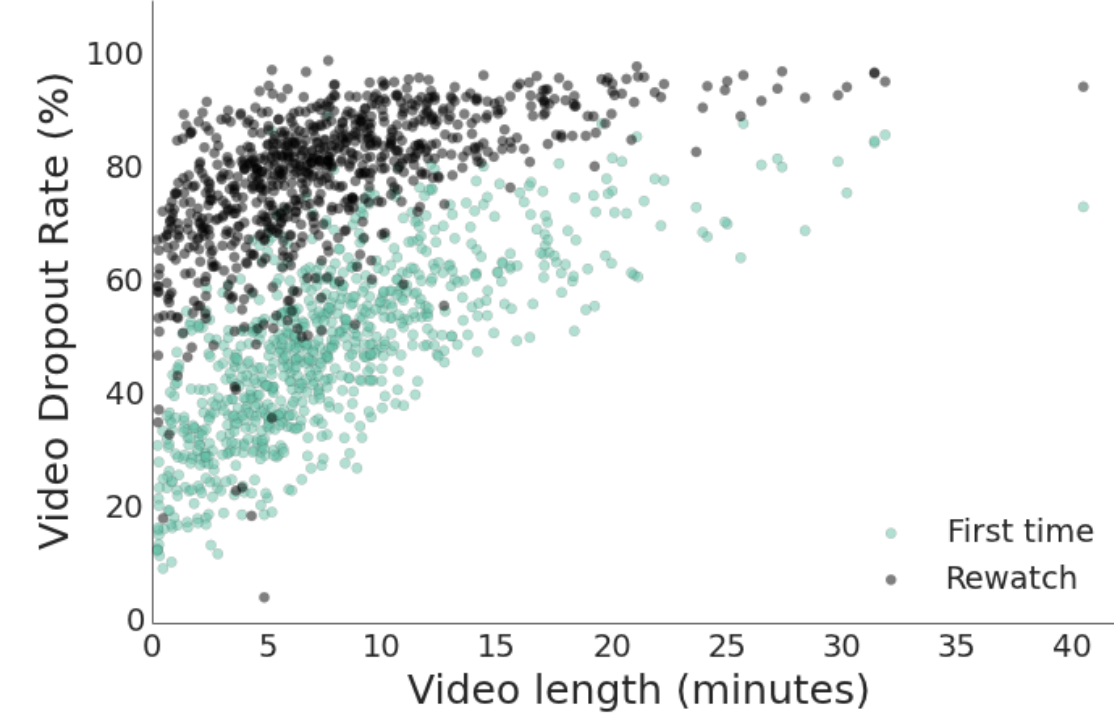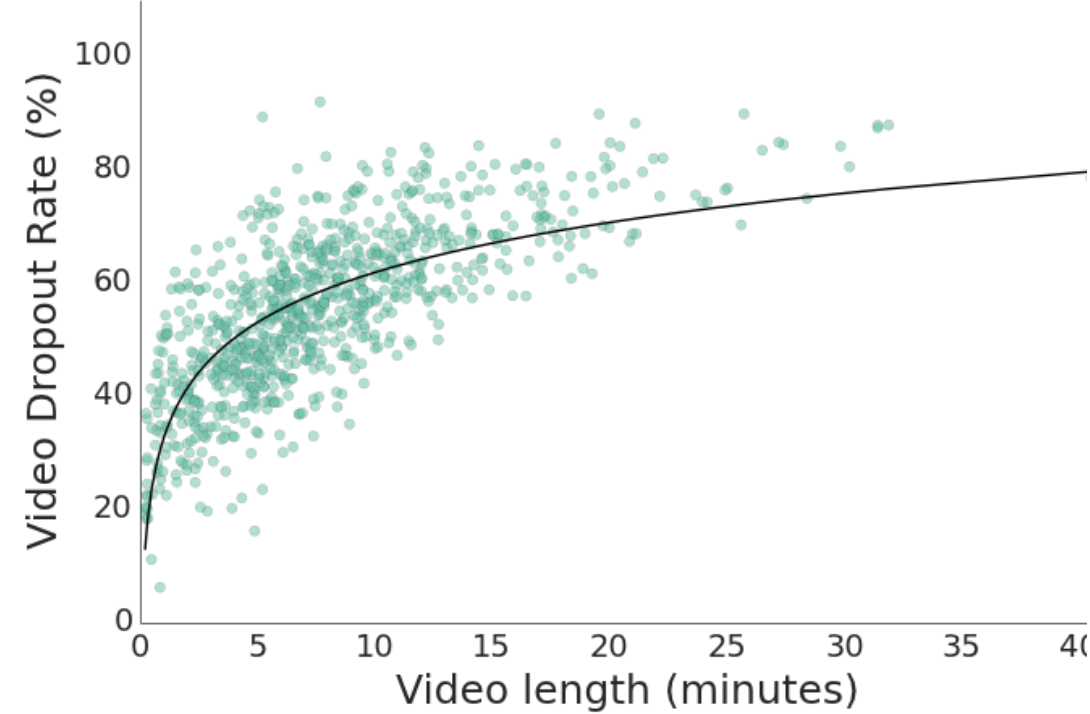
Interaction peak analysis

Interaction peaks occur when a significant number of students play, pause, or replay at the time of the video.
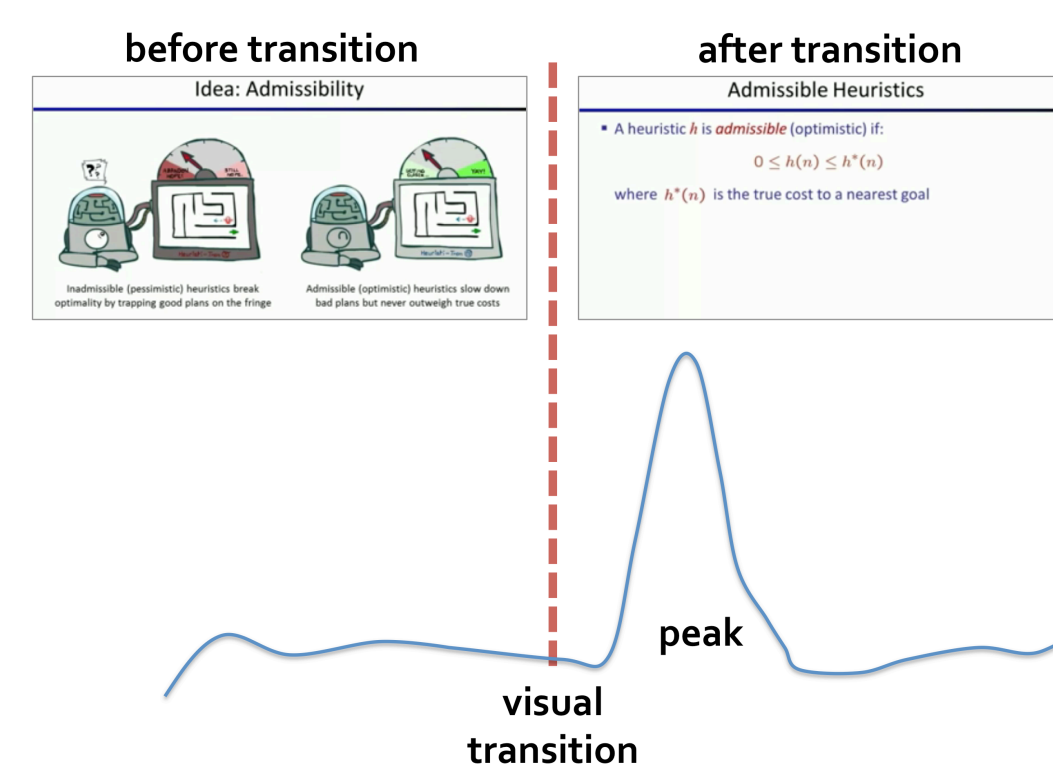
- 3.7 peaks per video on average

- **Tutorial videos** show more frequent and stronger peaks than **lecture videos.**

- **Re-watching sessions** show more frequent and stronger peaks than **first-time sessions.**

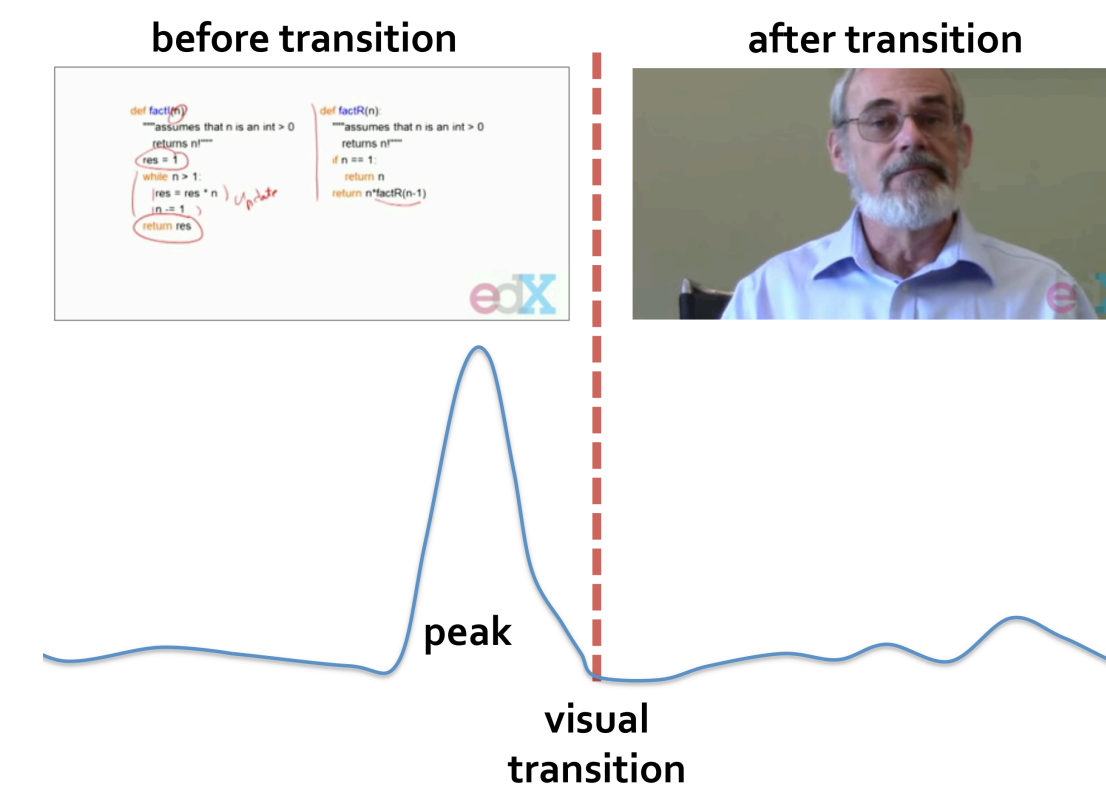## What causes interaction peaks to occur?

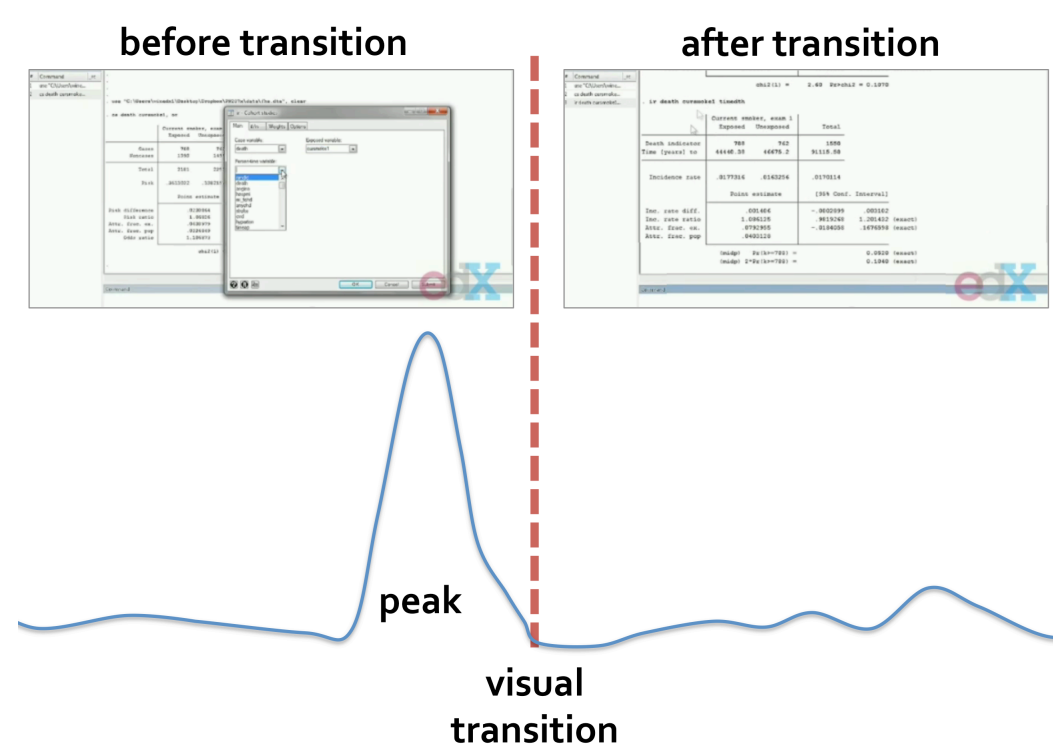**Observation**: interaction peaks often accompany visual transitions in the video.
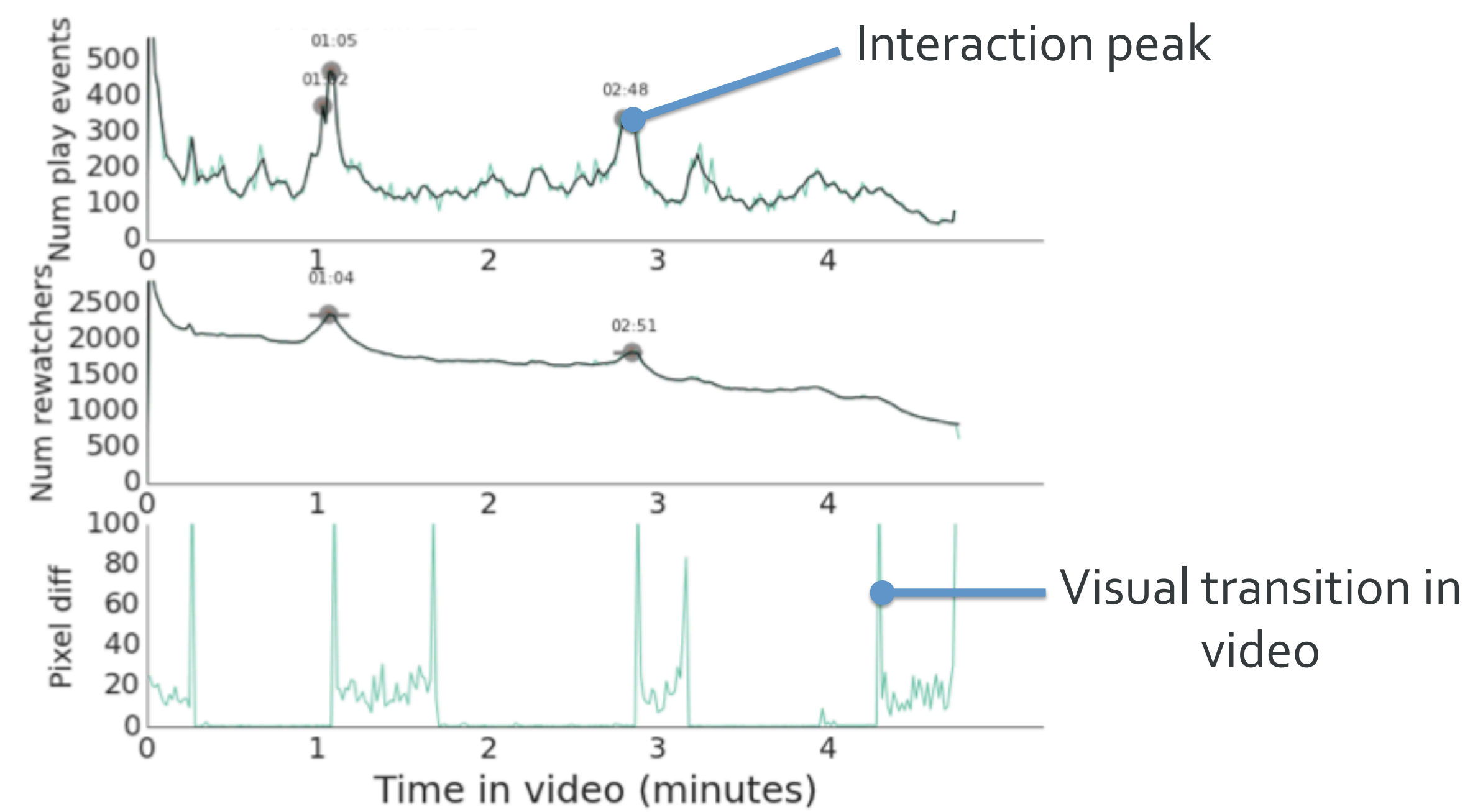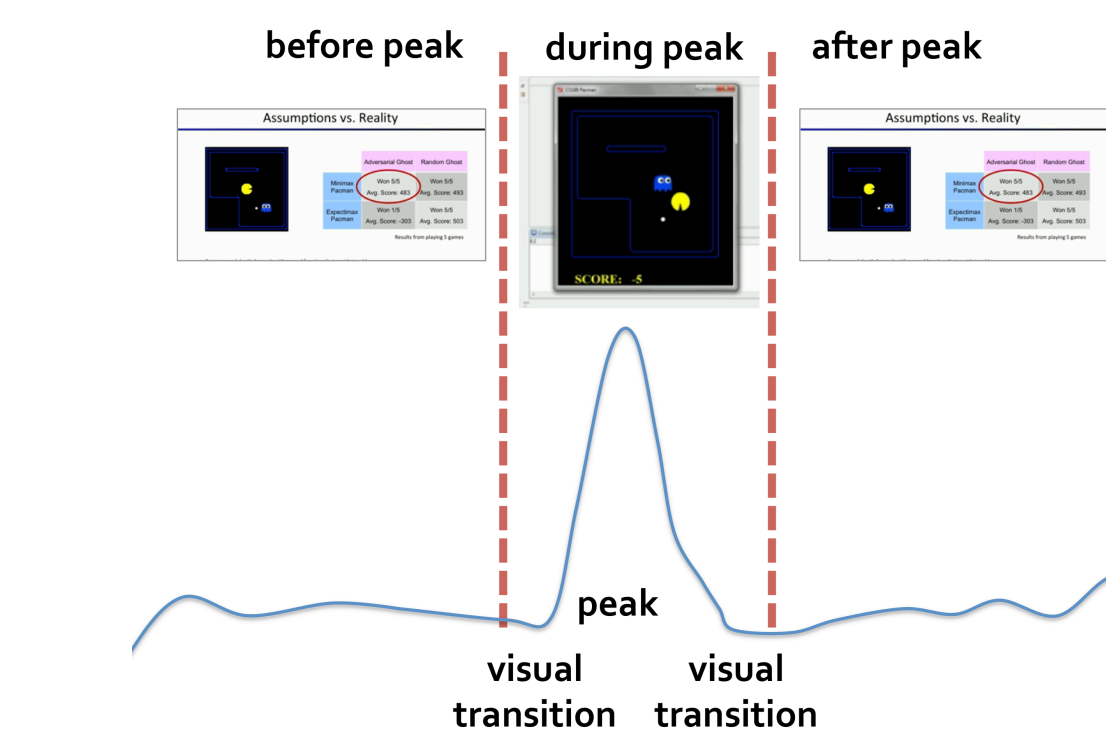

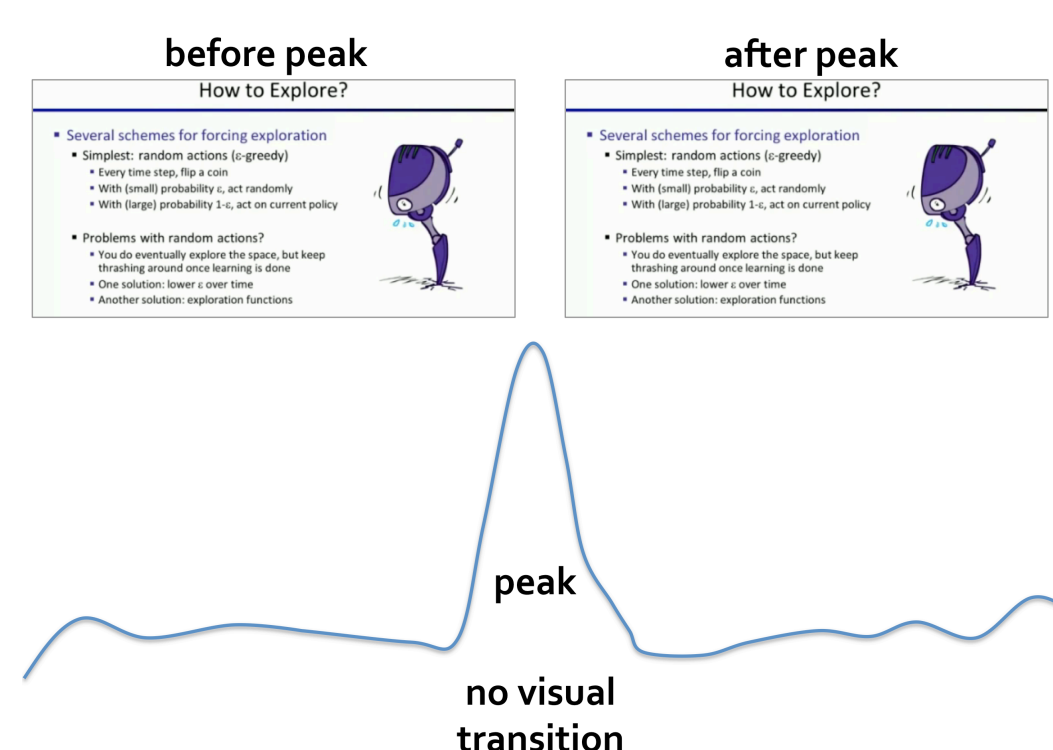### 1. Beginning of new material

2. Returning to content

3. Tutorial step

4. Replaying a segment

5. Non-visual explanation

More content channels for future analysis

- Transcript: text analysis
- Acoustic: speech analysis

Implications

For video editors & instructors

- Avoid sudden visual transitions
- Make shorter videos

For video interfaces

- Provide interactive links and screenshots for highlights.
- Consider video summarization for selective watchers.
- Enable one-click access for steps in tutorial videos.

Data-driven video interface

Can video interaction data be used to improve students' learning experience?

Video interface dynamically generated by learner data

Acknowledgements