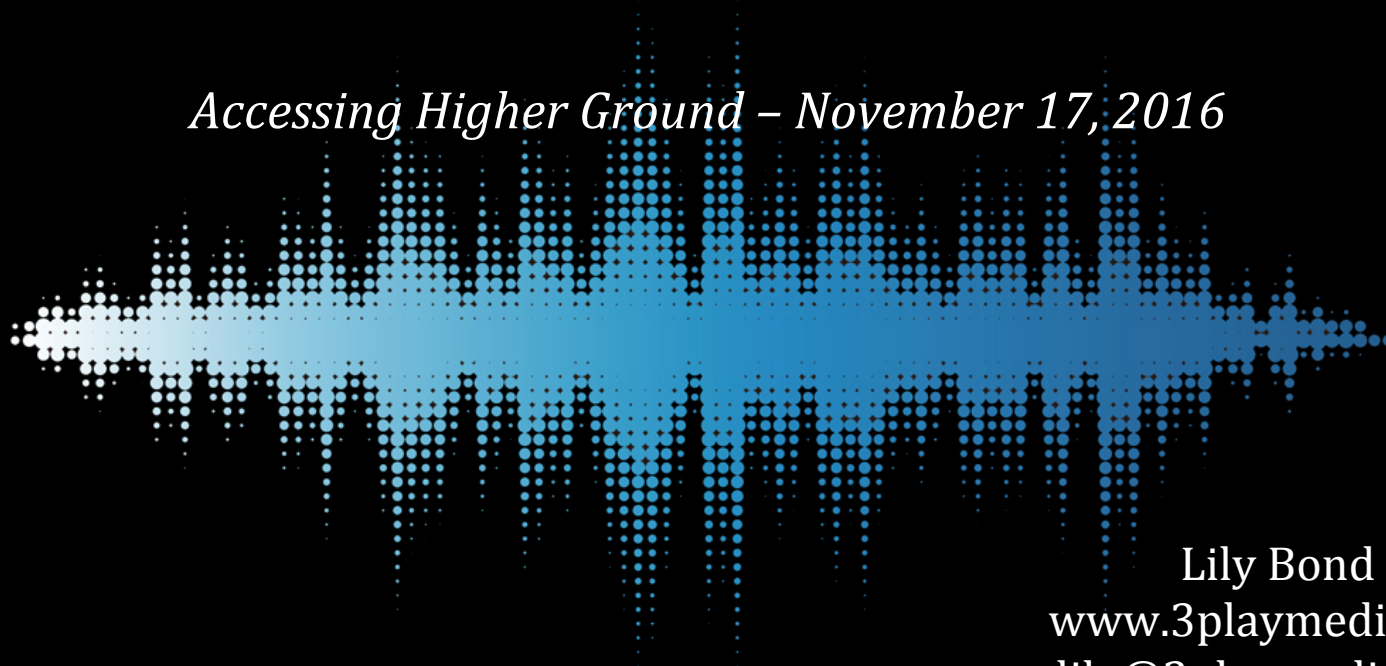


The Future of Closed Captioning

Accessing Higher Ground – November 17, 2016



Lily Bond

www.3playmedia.com

lily@3playmedia.com

[@lilybbond](https://twitter.com/lilybbond)

Agenda

- ▶ Quick Intro
- ▶ Current State + Future Growth:
 - Trends in Accessibility Law
 - Benefits of captioning
 - Technology – what is possible?
- ▶ Q&A

INTRO TO CAPTIONS & TRANSCRIPTS

What Are Captions?

- ▶ Text that has been time synchronized with the media
- ▶ Convey all spoken text & sound effects
- ▶ Originated in the early 1980s for broadcast television
- ▶ Captions vs. transcripts
- ▶ Captions vs. subtitles
- ▶ Closed vs. open captions



LEGAL TRENDS

Accessibility Laws: Rehabilitation Act

Rehabilitation Act: Sections 508, 504

- ▶ Covers federal agencies and orgs with federal funding
- ▶ Section 508 refresh coming ... ?



Accessibility Laws: ADA

Rehabilitation Act: Sections 508, 504

- ▶ Covers federal agencies and orgs with federal funding
- ▶ Section 508 refresh coming ... ?

ADA: Titles II, III

- ▶ Covers public and commercial entities
- ▶ Lawsuits: What is a “place of public accommodation”?
- ▶ Updates coming ... ?



Accessibility Laws: CVAA

Rehabilitation Act: Sections 508, 504

- ▶ Covers federal agencies and orgs with federal funding
- ▶ Section 508 refresh coming ... ?



ADA: Titles II, III

- ▶ Covers public and commercial entities
- ▶ Lawsuits: What is a “place of public accommodation”?
- ▶ Updates coming ... ?



CVAA

- ▶ Covers Internet content that aired on TV
- ▶ Includes video clips



Closed Captioning Lawsuits: Netflix

- ▶ **National Association of the Deaf (NAD), et al. v Netflix**
 - What constitutes a place of public accommodation?
 - How did the NAD originally bring Netflix under the ADA?
 - Settlement & implications



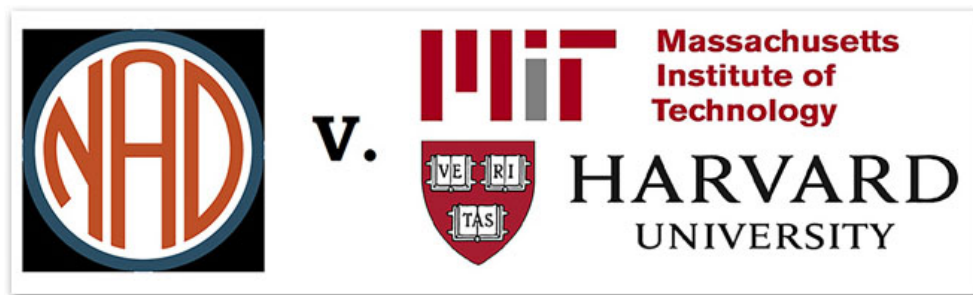
Closed Captioning Lawsuits: Harvard/MIT

- ▶ **National Association of the Deaf (NAD), et al. v Netflix**

- What constitutes a place of public accommodation?
- How did the NAD originally bring Netflix under the ADA?
- Settlement & implications

- ▶ **NAD vs. Harvard & MIT**

- Current state of the case
- Implications for higher education
- Changing scope of the ADA



OCR/DOJ Stance on Digital Access

► What have they said?

- “Excluding businesses that sell services through the Internet from the ADA would run afoul of the purposes of the ADA.” – *Judge Ponsor, NAD vs. Netflix*
- “The United States respectfully submits this Statement of Interest to correct Harvard’s misapplication of the primary jurisdiction doctrine and its misunderstanding of the ADA and Section 504.3.” – *DOJ, NAD vs. Harvard & MIT*
- “The denial of educational opportunities is precisely the type of discrimination that Congress sought to end.” – *DOJ, Dudley vs. Miami University*
- “As schools, school districts, states, and territories turn to the internet [...], they must make sure they are not inadvertently excluding people with disabilities from their online programs, services, and activities.” – *OCR Settlement Announcement*



Dear Colleague Letters from the OCR

▶ **University of Cincinnati**

- Concrete examples
- Breadth of online services OCR will cover



▶ **University of Phoenix**

- Covers WCAG standards
- Remedies students who may have been harmed by inaccessibility in the past



▶ **Michigan Department of Education**

- Identifies “violations” instead of complaints
- Lays out how to make videos accessible



Dudley vs. Miami University of Ohio

- ▶ **Extremely comprehensive**
- ▶ **Settled in Jan, 2016; consent decree released in October**
 - Landmark consent decree
 - 18 parts: https://www.ada.gov/miami_university_cd.html
 - Breadth of online services OCR will cover
 - Covers new content in addition to preexisting content, legacy, archives, and third party content.



UC Berkeley

- ▶ **Is the future grim?**
- ▶ **10-page letter from the DOJ to UC Berkeley in August, 2016**
 - Found UC Berkeley's MOOC content in violation of the ADA
 - Berkeley's statement: They "might not be able to continue to provide free public content under the conditions laid out by the Department of Justice to the extent [they] have in the past."



BENEFITS

Benefits

- ▶ **Accessibility for hard of hearing**
- ▶ **Better comprehension**
- ▶ **Flexibility to view in sound-sensitive environments**
- ▶ **Interactive video search**
- ▶ **SEO**
- ▶ **Reusability**
- ▶ **Translation**
- ▶ **May be required by law**

80%

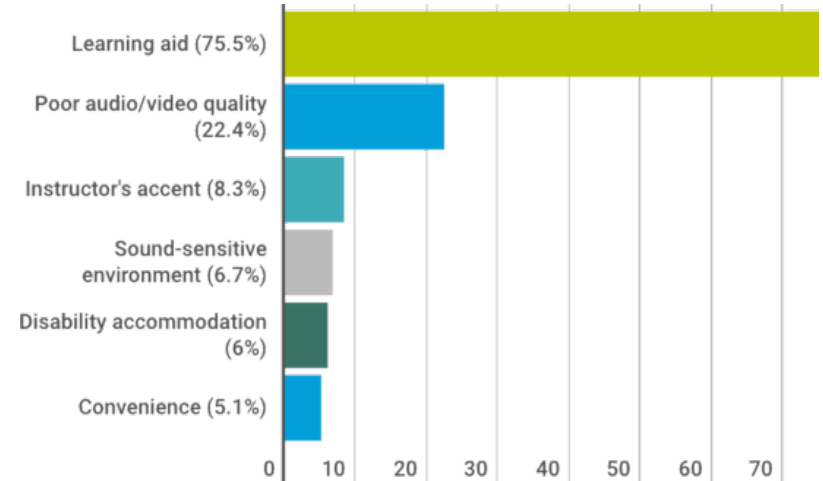
of people who use captions aren't
deaf or hard of hearing

48 Million

Americans with hearing loss

Research

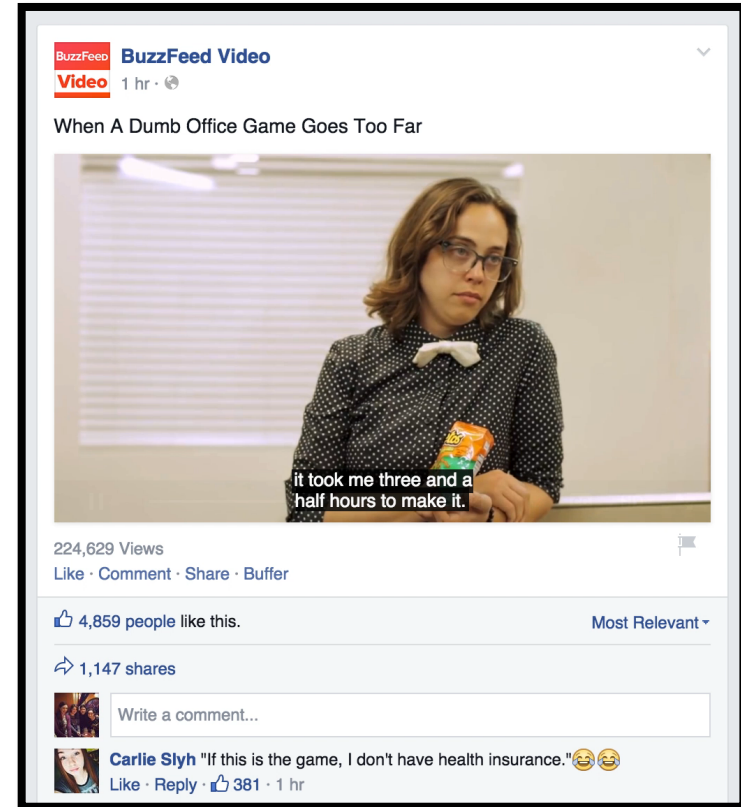
- ▶ **98.6% of students find captions helpful**
- ▶ **66% of ESL students find captions “very” or “extremely” helpful**
- ▶ **75% of students use captions as a learning aid**



Reasons for Using Captions

Benefits – Room to Grow

- ▶ **More research to prove the benefits outside of a11y**
- ▶ **Greater use in higher ed (and universally)**
- ▶ **Mobile video**
- ▶ **Better interactive implementation**
- ▶ **Universal implementation & access is also dependent on video players ...**



TECHNOLOGY

When will a totally automated, super cheap captioning solution be possible?

Why is Siri so good, but my captioning isn't?

▶ **Siri *is* really good. Here's why:**

- Single speaker
- Constrained tasks
- Clarification
- Did you catch my drift?

▶ **When ASR can be really good (even 90%!):**

- Single speaker
- High quality mic, reading from a script, no background noise
- Consistency



Common Errors: Example 1

- ▶ ASR keeps making the same mistake for an out-of-vocabulary word
- ▶ A human would recognize this mistake and never make it again

Welcome to game character made easy and 3D 3ds Max in this series of tutorials, we'll discuss how to quickly unwrap the knees of a game character with some very powerful tools and turn 3ds Max will start off by unwrapping the

Common Errors: Example 2

- ▶ Speaker changes not captured
- ▶ Hesitation words are not removed
- ▶ ASR errors occur which makes sense acoustically, but not linguistically

One of the most challenging aspects of choosing a career is simply determining where our interests lie now one common characteristic we saw in the majority of people we interviewed was a powerful connection

Common Errors: Example 3

- ▶ Struggles with out-of-vocabulary or “complex” words
- ▶ Meta!



What is “good enough?”

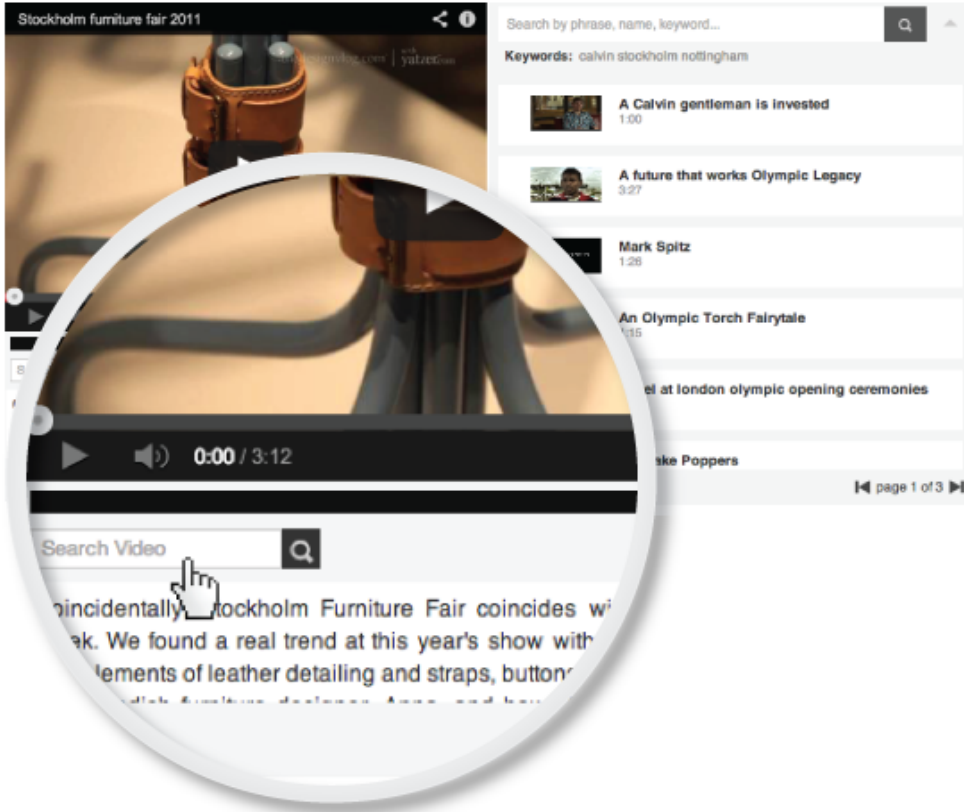
- ▶ Even 95% isn't sufficient for complex material
- ▶ Prone to fail on small “function” words:
 - “I *didn't* want to do that exercise.”
 - “I *did* want to do that exercise.”
- ▶ These errors are rare for humans

Video Transcription Accuracy Rates

Word-to-Word Accuracy	1 of x Words Incorrect	8-Word Sentence Accuracy	10-Word Sentence Accuracy
50%	1 of 2	0%	0%
67%	1 of 3	4%	2%
75%	1 of 4	10%	6%
85%	1 of 7	27%	20%
90%	1 of 10	43%	35%
95%	1 of 20	66%	60%
98%	1 of 50	85%	82%
99%	1 of 100	92%	90%

Video Search

What Are Interactive Transcripts?



- ▶ Use captions to make videos searchable and interactive
- ▶ Not a replacement for captions
- ▶ Easy to set up
- ▶ Lots of customization options
- ▶ Top 3 innovations in online video
- ▶ Focus on activating features with HTML class names

Examples: Basic

- ▶ p3sdk-container
 - YouTube player embed
 - p3sdk-interactive-transcript
 - p3sdk-interactive-transcript-content
- ▶ Basic styling
 - Transcript paragraphs justified alignment
 - Current word is red



My name is Sara, and my role in the opening ceremony of the Olympics was I was an NHS nurse.

I'm Denis. I'm one of the drummer marshals that took part in the Pandemonium section of the opening ceremony of the Olympics.

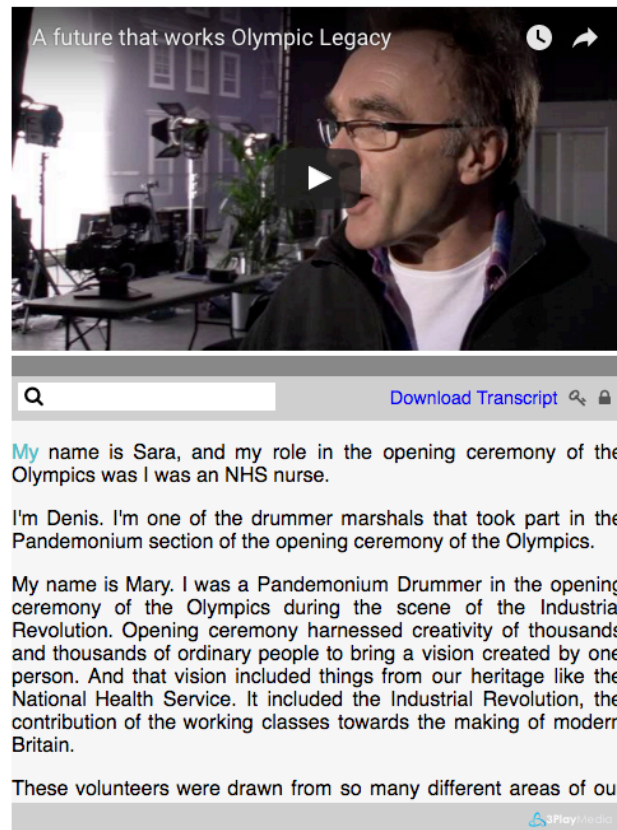
My name is Mary. I was a Pandemonium Drummer in the opening ceremony of the Olympics during the scene of the Industrial Revolution. Opening ceremony harnessed creativity of thousands and thousands of ordinary people to bring a vision created by one person. And that vision included things from our heritage like the National Health Service. It included the Industrial Revolution, the contribution of the working classes towards the making of modern Britain.

These volunteers were drawn from so many different areas of our lives, really.

<http://interactive.3playmedia.com/p3sdk/basic.html>

Examples: Changing Color Schemes

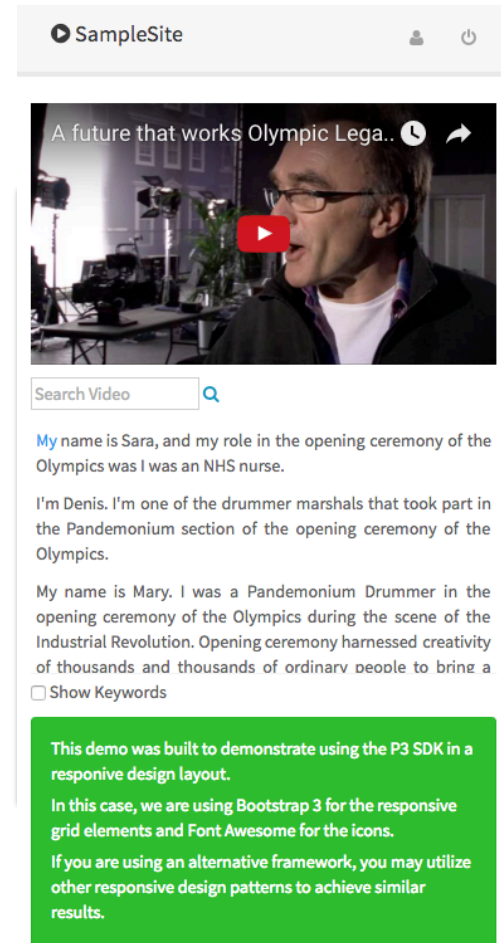
- ▶ Basic CSS modifications
- ▶ Components
 - Currently spoken word
 - Progress bar
 - Download link
 - Search box
 - Collapse button



<http://interactive.3playmedia.com/p3sdk/custom.html>

Examples: Responsive

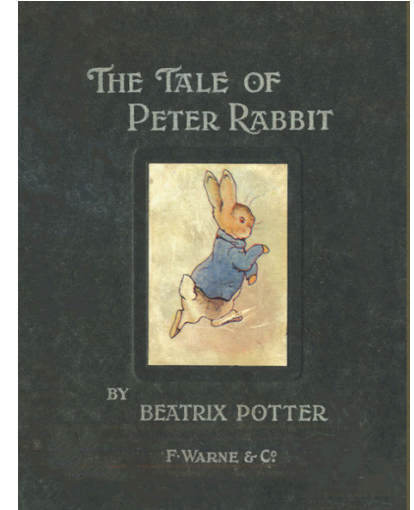
- ▶ Twitter Bootstrap responsive layout
- ▶ Remove components for mobile display
- ▶ Hide features that are not compatible with iOS



<http://interactive.3playmedia.com/p3sdk/responsive/index.html>

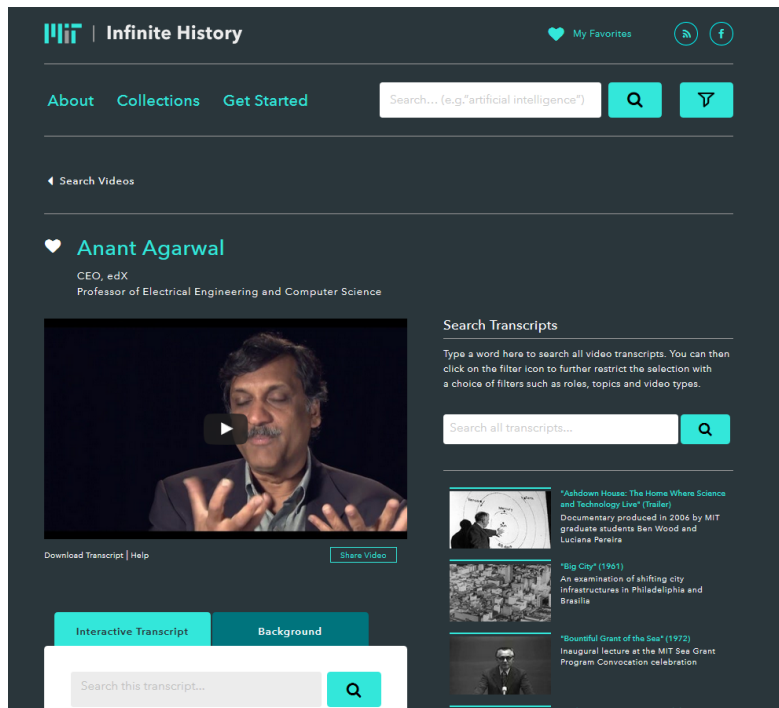
Advanced Example: Interactive Audiobook

- ▶ Advanced CSS
- ▶ Advanced Javascript binding to events
- ▶ External Controls



<http://interactive.3playmedia.com/p3sdk/audiobook/index.html>

Advanced Example: Searchable Video Library



I need my captions back super fast!

Workflow Possibilities

- ▶ How fast is super fast?
- ▶ What if I need it back faster?
- ▶ I don't want to do any work!
- ▶ I don't use a video platform and I still don't want to do any work!

Think outside of the box

Some possibilities:

- ▶ Video search for everyone!
- ▶ More customization on all platforms
- ▶ Note taking
- ▶ Social sharing
- ▶ Advertising
- ▶ Hive mind

“Access to information and communication technologies is increasingly becoming the gateway civil rights issue for individuals with disabilities.”

- Department of Justice

Q&A

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[@lilybbond](https://twitter.com/lilybbond)