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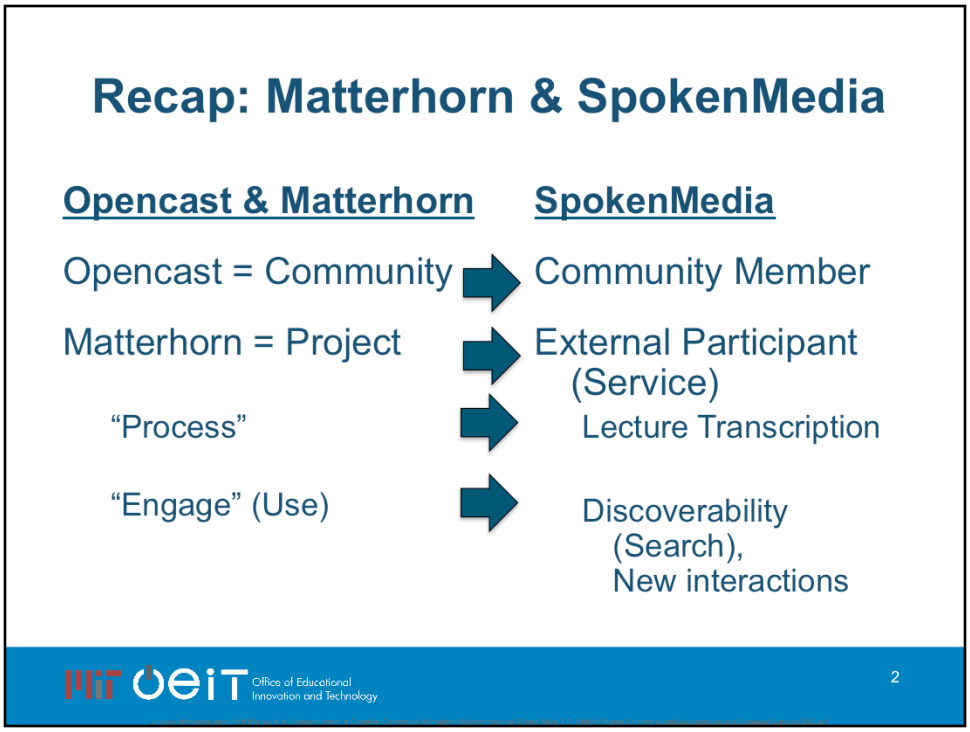

Recap

• How is SpokenMedia related to Opencast Matterhorn (http://www.opencastproject.org/?

Why are we doing this?

MIT OCW 8.01: Professor Lewin puts his life on the line in Lecture 11 by demonstrating his faith in the Conservation of Mechanical Energy.

- More & more videos on the Web
  - Universities **recording** course **lectures**
  - **Students** (and universities) **relying** upon Web video for **learning**

MIT OEIT Office of Educational Innovation and Technology

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Why are we doing this?

• In the last few years, we've seen an explosion of videos on the web.

• Self publishing by millions on YouTube.

• Universities recording course lectures and putting them on the web.

  • A couple different models:

  • UC Berkeley (and most of the world) recording courses for matriculated/ enrolled students…and then everyone else

  • MIT OpenCourseWare publishing snapshots of courses

• Students are relying upon web video for learning. Common statistic mentioned by folks like UC Berkeley (which has been doing course webcasts since 1999) is that usage spikes as students prepare for tests, and that they tend to focus on small segments of the video

  • Time shifting (ucb)

  • Study tool (ucb, students mark in their personal notes when they don't understand something during the class to go back and review later)

  • Learning from other instructors (ucb)

  • Disabilities (ucb, learning, audio)

  • Course Selection (ucb)

• Also, cultural organizations (museums, foundations, non-profit organizations) sharing their interviews on the web. Other similar single speaker web video, cost of technology has come down.

<u>What video? Where?</u>

- Where do I go to find these resources?
    - University's websites
    - Search Engines
    - Video aggregators

What are the challenges? Search

Large volume of material to search through!

Search results—approximately 3 Million in Google (April 2009):

• Wikipedia, Angular and Conservation of Angular Momentum links might be useful

• Quantum mechanics link is probably too advanced

• Angular Momentum (company) probably not useful

• But no videos

Oh, there's a way of just doing a video search at Google, search is segmented by media type

Google Video Search results—only 400 (April 2009), that's better:

• All appear to be relevant

• Two are lecture length (i.e. 20+ minutes or longer): Mechanical Universe, and Lecture 21 from MIT OCW

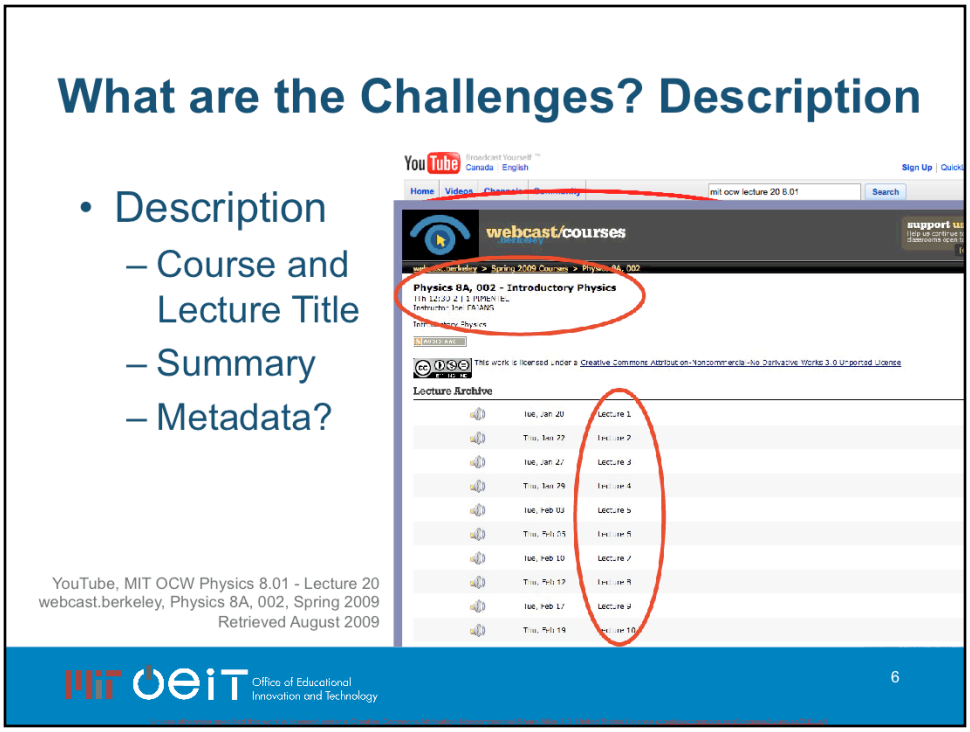
• Four are probably demos relating angular momentum to physical examples (tennis, ice skating)

Search results are based on:

• Metadata

• Title of video/link

• Text description of video (typically short), or the text surrounding an embedded video



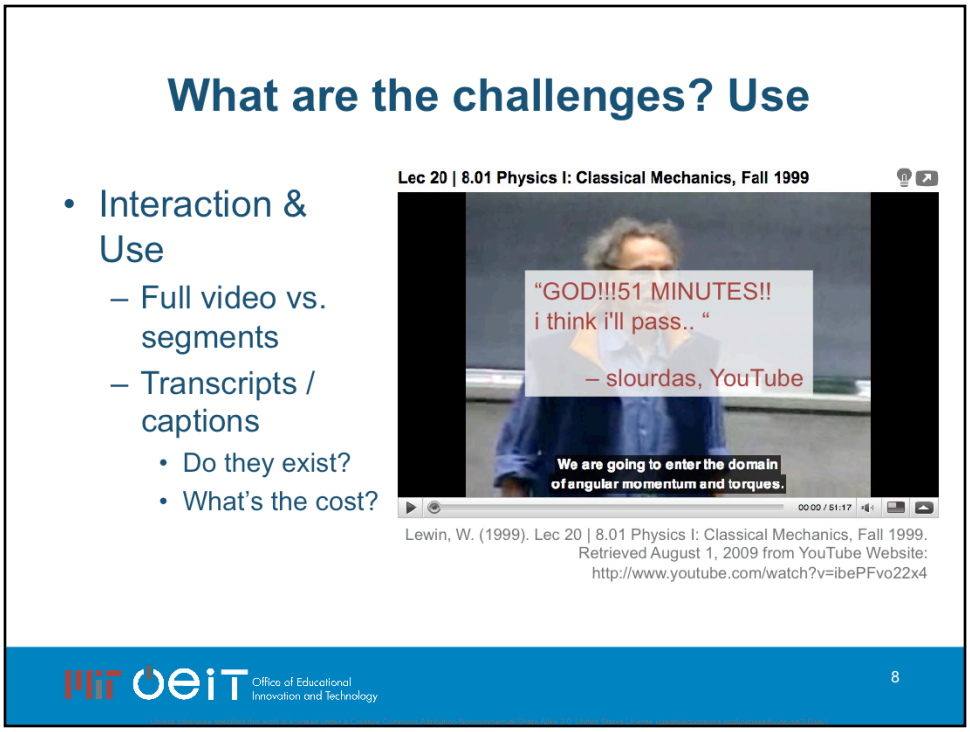
What are the Challenges? Description

• Videos are described with titles and a short 1-2 sentence description

• Or Videos are described relative to their users, in the case of webcast.berkeley, they're listed by lecture (so are MIT OCW's), but in this example that's all we have, it'll make more sense to the students in the classes.

What are the Challenges? Playback

- For playback directly from University websites, what should the UI be?
- Here's an alternative view of Lewin's 8.01, Physics Lecture 20 as displayed at VideoLectures.net
- Should there be additional features or support?



<u>What are the additional challenges?</u>

Interaction and Use

• Get the full length video, over 50 minutes

• There may or may not be a transcript, which may or may not be displayed as captioning for accessibility

Policy Implications

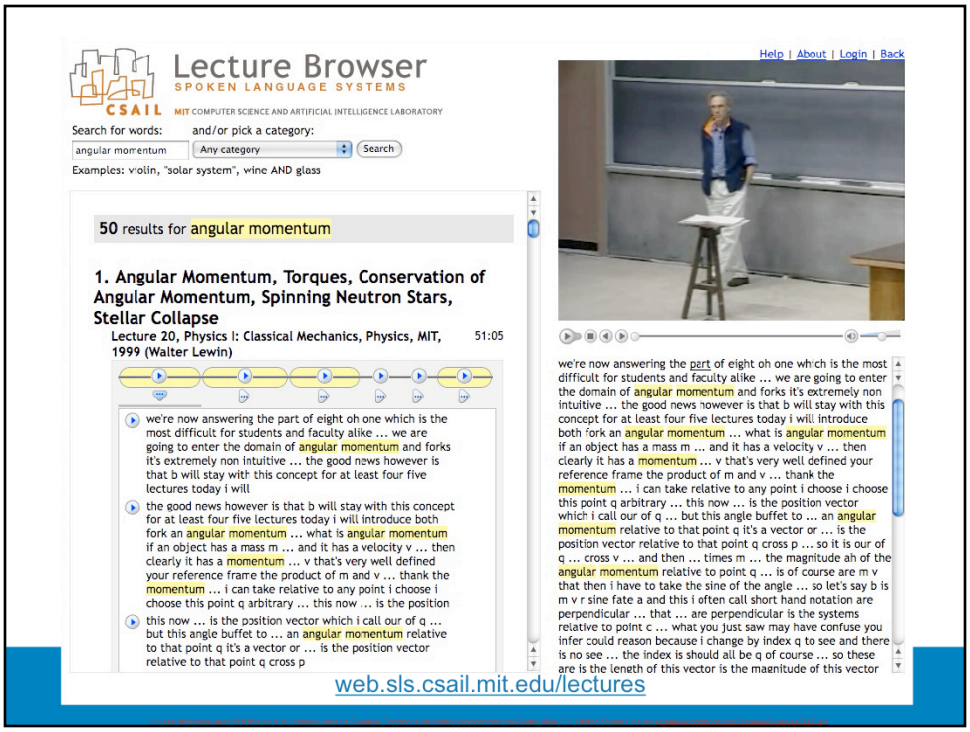
• Technology allows for bookmarking and comments, they aren't enabled

Why do we want these tools?

• MIT as the customer

• Lots of materials, 1900+ OCW courses, some with video/audio

• Opportunities for positive change: improving presentation and user experience, advocate for new methods of interaction



Spoken Lecture Browser Demo

- http://web.sls.csail.mit.edu/lectures/

• Requires Real Player

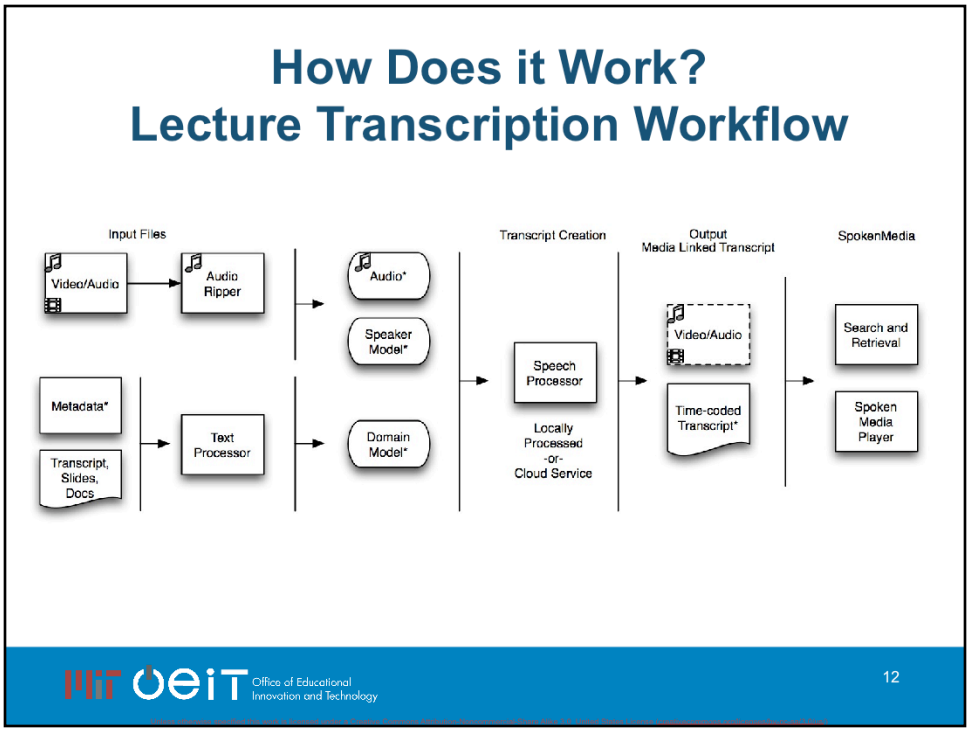
- Search of video library
- Search results show search query in context, query highlighted in yellow
- Results show "conceptual chunks"
- Player controls video and bouncing ball in the transcript
- Uses 2006 technology, Real Player – needs to get updated for current technology
    - Much of the work for the Spoken Lecture browser and player completed in 2006 (though recognizer research continues)
    - In 2006, Real could allow within movie bookmarks and playback
    - In 2006, Real was the preferred high-quality video playback mechanism on the Web (lots has changed since then)

Spoken Lecture Project

• Supported by iCampus

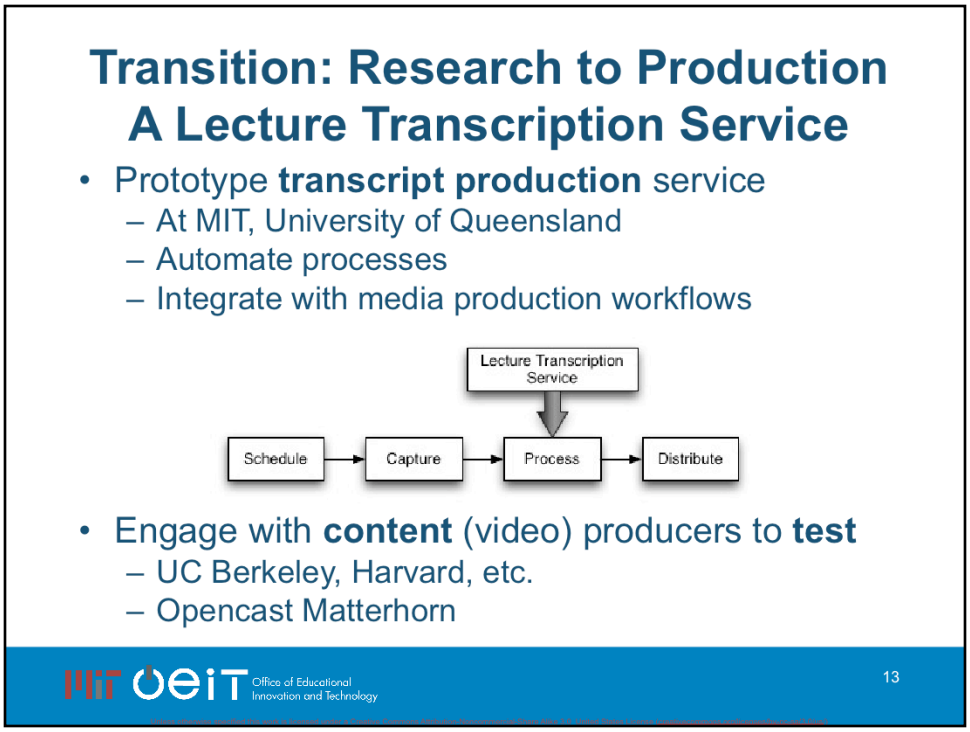
• Includes the browser (which was just demo'd) the processor (back end lecture transcription) and a hand workflow to do the processing

• Approximately 400 hours of video indexed



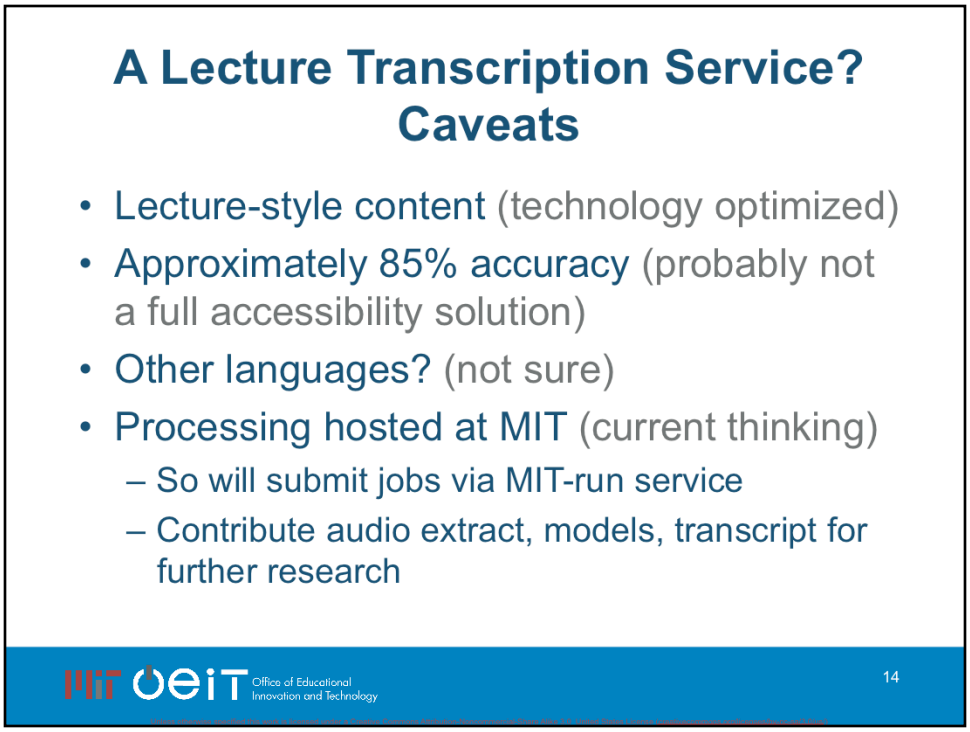
How does it work?

- Audio
  - System only needs audio (waveform), extracts from video
- Domain Model (base is generic domain model)
  - System needs to know what words it can expect to find in the audio
  - Syllabus, lecture notes, index from text book, research papers
  - Build library of domains
  - Separate sub-process for text for domain model
- Speaker model (base is generic speaker model)
  - If multiple lectures by the same author, best to create a speaker model
  - Separate sub-process for speaker model
- Process—With audio, domain and speaker models
- Output
  - Time coded transcript (standard formats)
  - Links media and transcript
- Applications
  - Search/retrieval
  - Player



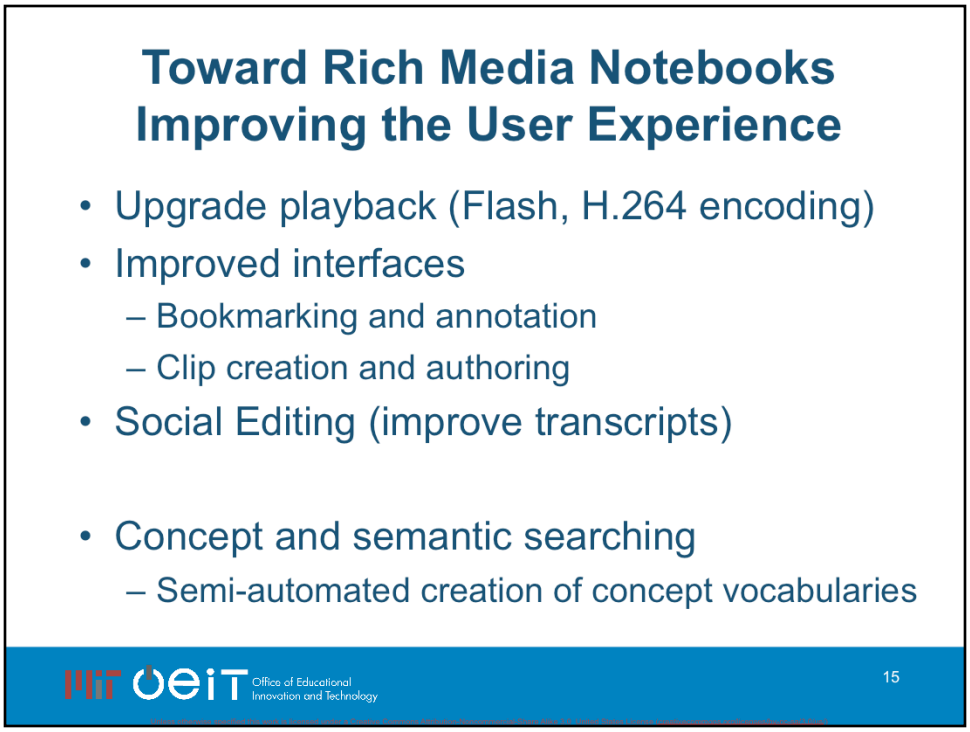
Towards a Lecture Transcription Service

- OEIT at MIT's goal is to transition from research to production
  - First priority to get running on our servers
- Prototype a transcript production service—second priority
  - For MIT
  - Automate a mostly hand process
  - Considering integration with local Podcast Producer workflow engine (Apple)
  - Integrate into media production workflow, as a plugin
- Partner with other content producers to test service—tied for third priority
  - See how it meets needs of other content producers
  - See how it plays with Opencast Matterhorn, distributed service



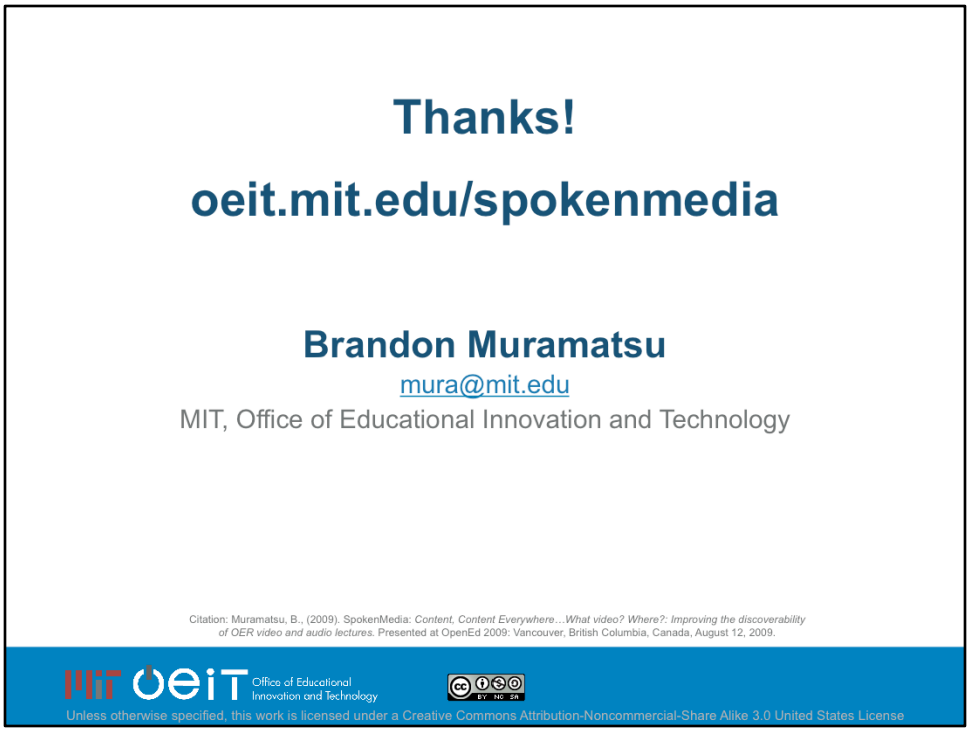
A Lecture Transcription Service? Caveats

- Full disclosure, limitations we know about or think are important
- We've been asked about other languages
    - Should be possible
    - Jim Glass is experimenting with Chinese
    - Would have to create a language model, not sure what's involved with that
- Current plan to host a web service from MIT
    - Contribution will be important aspect of participation



Toward Rich Media Notebooks

- Updating the playback—third priority
    - Flash and H.264 encoded video
- Implement other common video features (e.g., from YouTube and other commercial video sites)
    - Bookmarking, annotations and comments (timestamp, text fields)
    - Clip creation (ala XMAS cross media annotation system)
- Down the road
    - Social editing to improve transcripts, wiki interfaces, trust systems
    - Concept and semantic searching—current system breaks text up into "logical" chunks, and lets users search for a term or phrase, but doesn't really get to concepts.



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