

SpokenMedia

*Content, Content Everywhere...What video?
Where?: Improving the discoverability of OER
video and audio lectures*

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Recap: Matterhorn & SpokenMedia

Opencast & Matterhorn

Opencast = Community

Matterhorn = Project

“Process”

“Engage” (Use)

SpokenMedia

Community Member

External Participant
(Service)

Lecture Transcription

Discoverability
(Search),
New interactions

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**

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.

What video? Where?



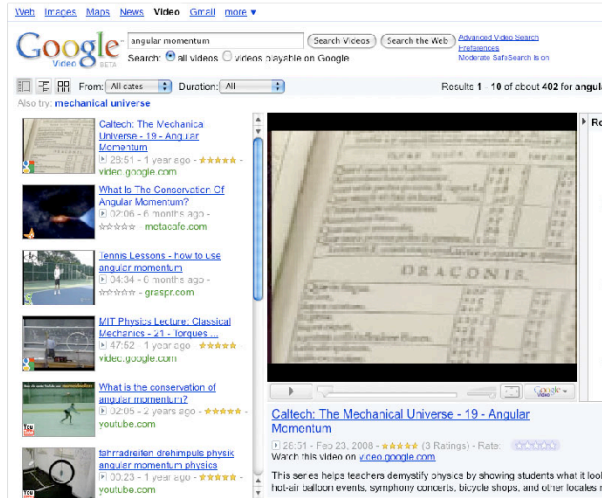
What video? Where?

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

What are the challenges? Search

- Search
 - Volume
 - Segmented by Web, Video

Google Search for
"angular momentum"
Performed April 2009



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

- Description
 - Course and Lecture Title
 - Summary
 - Metadata?




YouTube, MIT OCW Physics 8.01 - Lecture 20
webcast.berkeley, Physics 8A, 002, Spring 2009
Retrieved August 2009

The screenshot shows the webcast.berkeley website. The main heading is "Physics 8A, 002 - Introductory Physics". Below this, there is a "Lecture Archive" section with a table of lectures. The table has three columns: "Lecture", "Date", and "Title". The lectures are listed from 1 to 10. Red circles highlight the course title and the lecture list.

Lecture	Date	Title
LEC 1	Jan 20	Jan 20
LEC 2	Jan 22	Jan 22
LEC 3	Jan 24	Jan 24
LEC 4	Jan 26	Jan 26
LEC 5	Jan 28	Jan 28
LEC 6	Jan 30	Jan 30
LEC 7	Jan 31	Jan 31
LEC 8	Feb 02	Feb 02
LEC 9	Feb 04	Feb 04
LEC 10	Feb 06	Feb 06


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.

Link this page   

Would you like to put a link to this lecture on your homepage?
Go ahead! Copy the [HTML snippet](#)!

Reviews and comments:

 1 Arihant Sogani, October 21, 2008 at 5:53 p.m.:
Helpful in understanding from a different point

Write your own review or comment:






Name

Email address

URL

Comment

Lecture rating

People found this lecture:
Worth seeing 
because it is:
Valuable and informative 
Well presented 
Easily understandable 
Acceptably recorded 
You need to [login](#) to cast your vote.


Report a problem or upload files

If you have found a problem with this lecture or would like to send us extra material, articles, exercises, etc., please use our [ticket system](#) to describe your request and upload the data.
Enter your e-mail into the 'Cc' field, and we will keep you updated with your request's status.


Related content

[See Also](#) [Personal history](#) [More by author](#)

Visitors who watched this lecture also watched...



Lecture 19: Rotating Rigid Bodies - Moment of Inertia - Parallel Axis and Perpendicular Axis Theorem - Rotational Kinetic Energy - Fly Wheels - Neutron Stars - Pulsars
Walter H. G. Lewin



Lecture 21: Torques - Oscillating Bodies - Hoops
Walter H. G. Lewin

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http://videolectures.net/mit801f99_lewin Lec20/
Retrieved August 2009

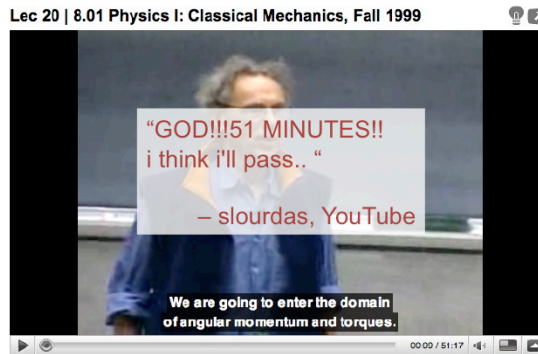
7

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?

What are the challenges? Use

- Interaction & Use
 - Full video vs. segments
 - Transcripts / captions
 - Do they exist?
 - What's the cost?



Lewin, W. (1999). Lec 20 | 8.01 Physics I: Classical Mechanics, Fall 1999. Retrieved August 1, 2009 from YouTube Website: <http://www.youtube.com/watch?v=ibePFvo22x4>

What are the additional challenges?

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

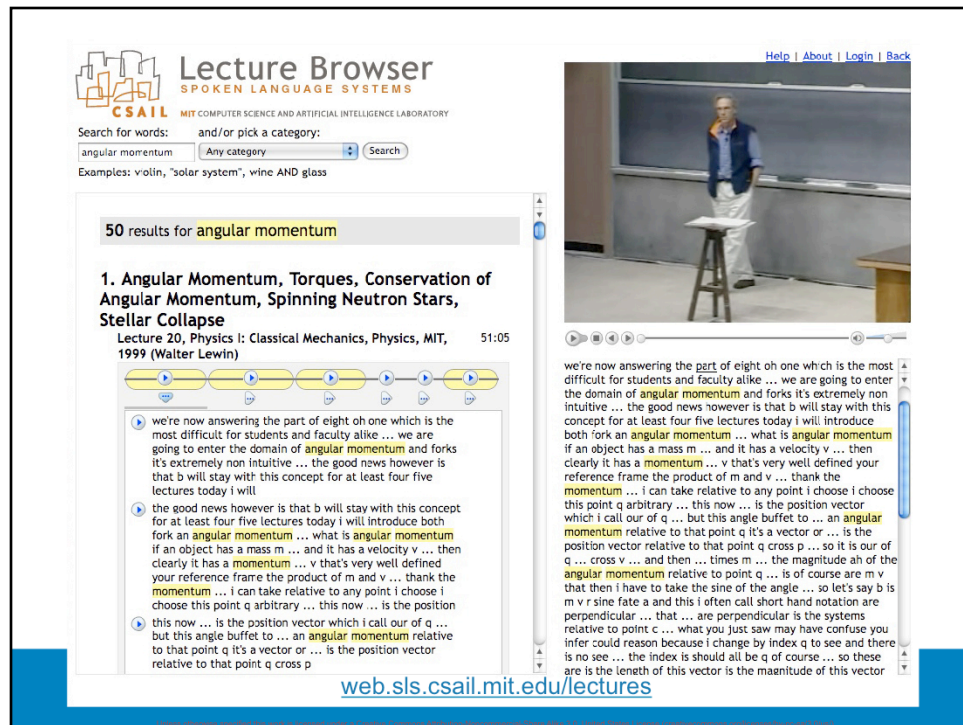
- Technology allows for bookmarking and comments, they aren't enabled

Why are we interested?

- **Improve search** and retrieval
- What do we have?
 - Existing videos & audio, new video
 - Lecture notes, slides, etc. (descriptive text)
 - Multiple videos/audio by same lecturer (scale)
 - Diverse topics/disciplines
- **Improve presentation and user experience**
- Captioning for accessibility
- Facilitate translation, other uses?

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

James Glass
glass@mit.edu



- Research in spoken language
- Why **lectures**?
 - Conversational, spontaneous, starts/stops
 - Different from broadcast news, other types
 - Specialized vocabularies
- **Processor, browser, workflow**
- Prototyped with lecture & seminar video

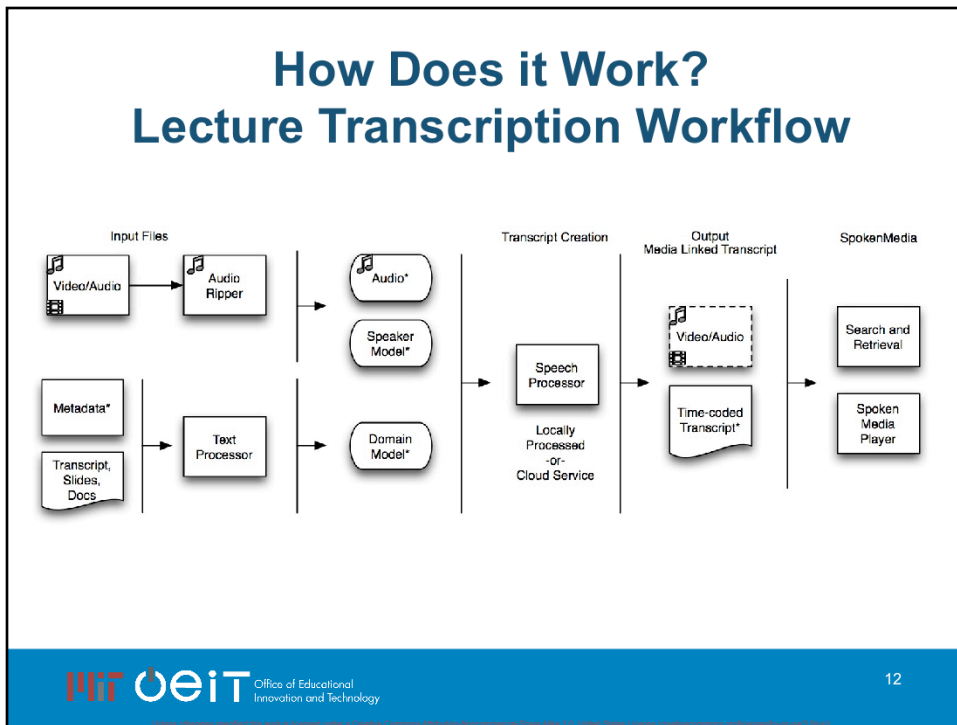
Supported with iCampus MIT/Microsoft Alliance funding

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?

Lecture Transcription Workflow

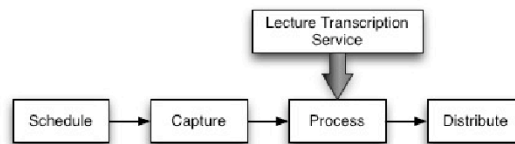


How does it work?

- 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

Transition: Research to Production A Lecture Transcription Service

- Prototype **transcript production** service
 - At MIT, University of Queensland
 - Automate processes
 - Integrate with media production workflows



- Engage with **content** (video) producers to **test**
 - UC Berkeley, Harvard, etc.
 - Opencast Matterhorn

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

- Lecture-style content (technology optimized)
- Approximately 85% accuracy (probably not a full accessibility solution)
- Other languages? (not sure)
- Processing hosted at MIT (current thinking)
 - So will submit jobs via MIT-run service
 - Contribute audio extract, models, transcript for further research

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 Improving the User Experience

- Upgrade playback (Flash, H.264 encoding)
- Improved interfaces
 - Bookmarking and annotation
 - Clip creation and authoring
- Social Editing (improve transcripts)
- Concept and semantic searching
 - Semi-automated creation of concept vocabularies

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.

Thanks!

oeit.mit.edu/spokenmedia

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