

MUSIC INFORMATION RETRIEVAL: AN OVERVIEW

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Mathemusical Conversations Study Day
12 February 2015
Raffles Institution

OUTLINE

- A bit about me
- Applications (the fun stuff!)
- How do they do it?

National Institute of Advanced Industrial Science and Technology

Media Interaction Group

Tsukuba

Operations Research Engineering

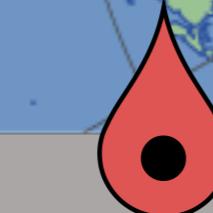
USC

Los Angeles

Music Technology

McGill

Montreal

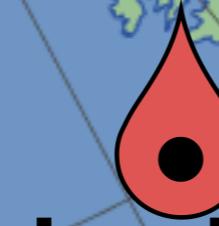


Boston

Harvard

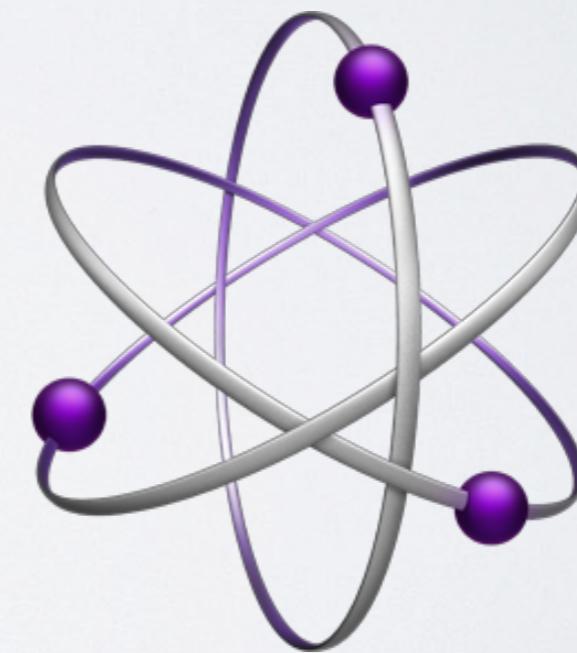
Music and Physics

Queen Mary University of London
Electrical Engineering and Computer Science



London

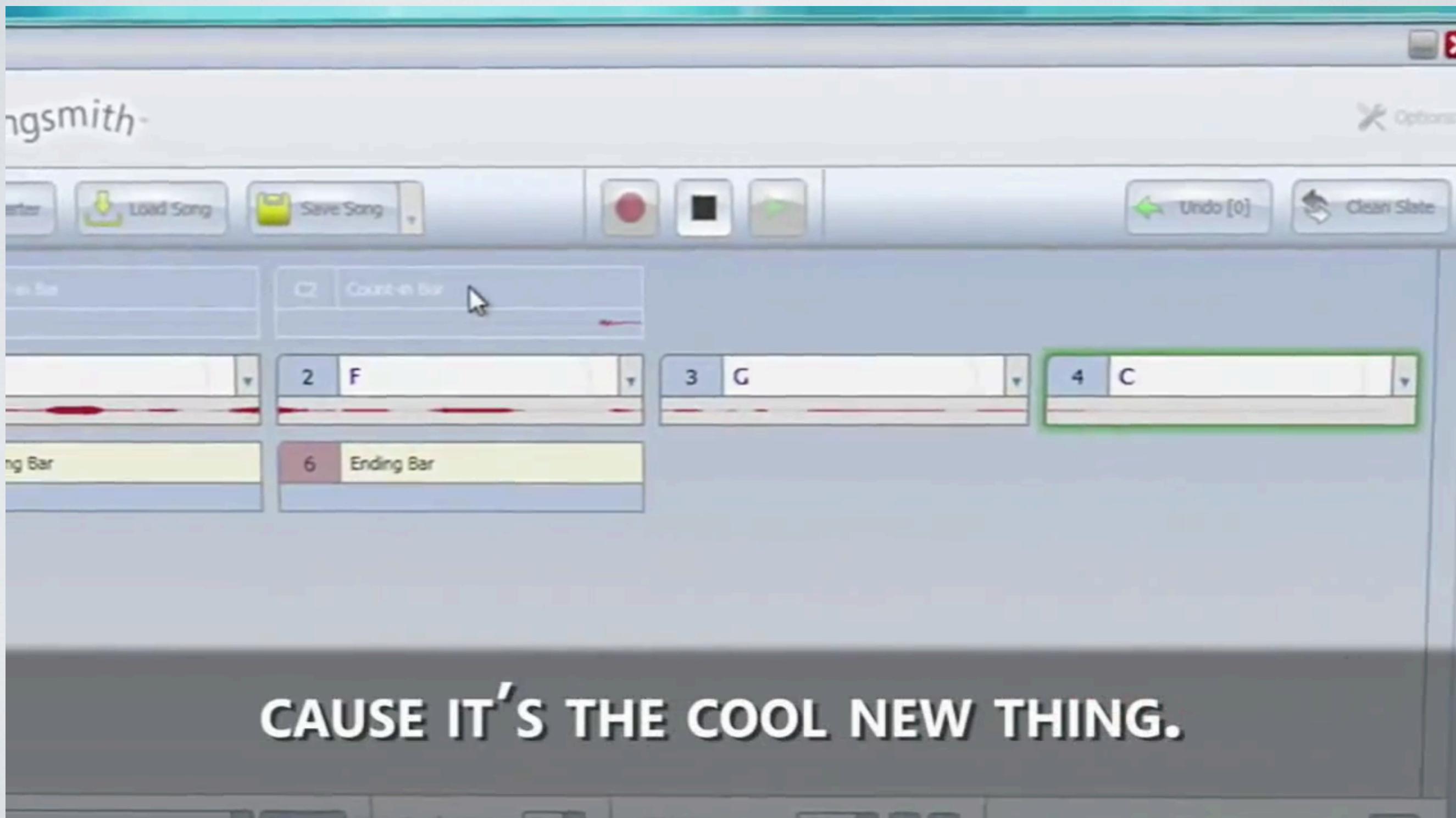
MIR APPLICATIONS



Music Fingerprinting
Query By Humming

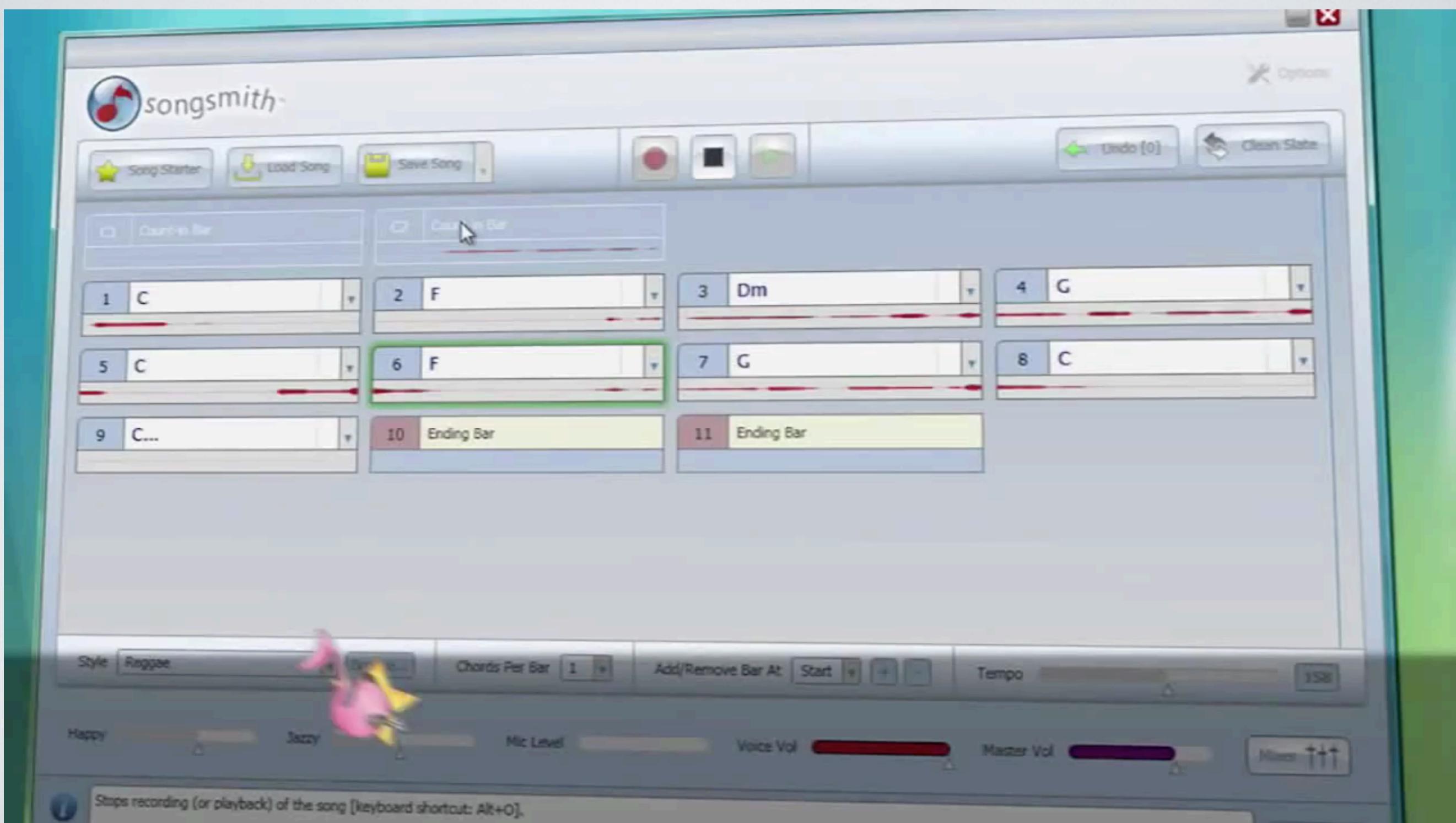
Music Similarity & Recommendation
Playlist Generation

MIR APPLICATIONS



CAUSE IT'S THE COOL NEW THING.

MIR APPLICATIONS



Microsoft Songsmith commercial: <https://www.youtube.com/watch?v=3oGFogwcxE>

MIR APPLICATIONS

- Recognition (e.g., Shazam, SoundHound)
- Recommender systems (e.g., Spotify, Pandora, YouTube, iTunes Genius)
- Play (e.g., Microsoft Songsmith)
- Metadata management (e.g., Gracenote, MusicBrainz)



Customer Company

Solutions Showcase

Blog
Jobs

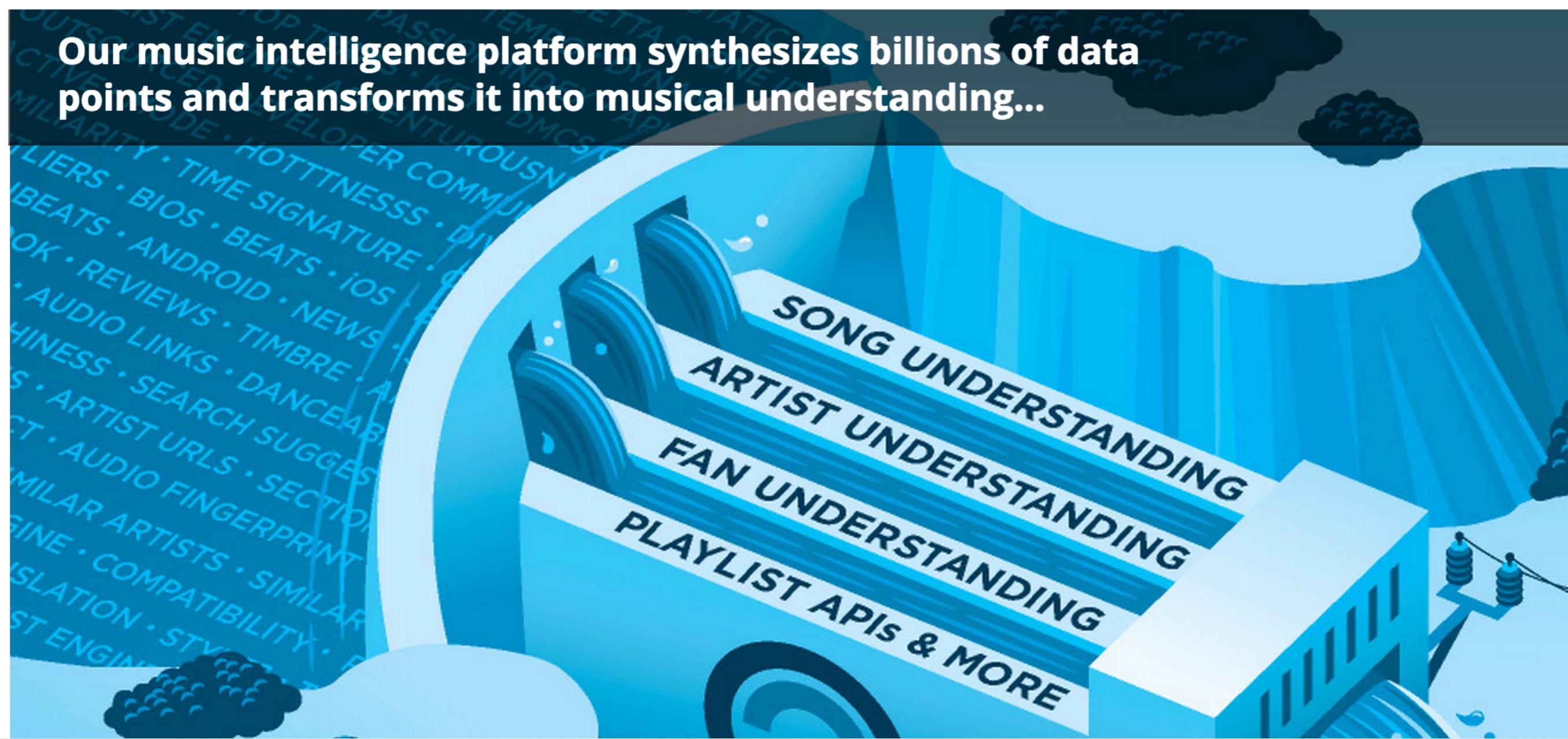
Developers News

We Know Music...

Subscrib

Sign up for our newsletter for updates on new feature releases, developer meet-ups and new apps powered by our platform.

Our music intelligence platform synthesizes billions of data points and transforms it into musical understanding...



echonest.com

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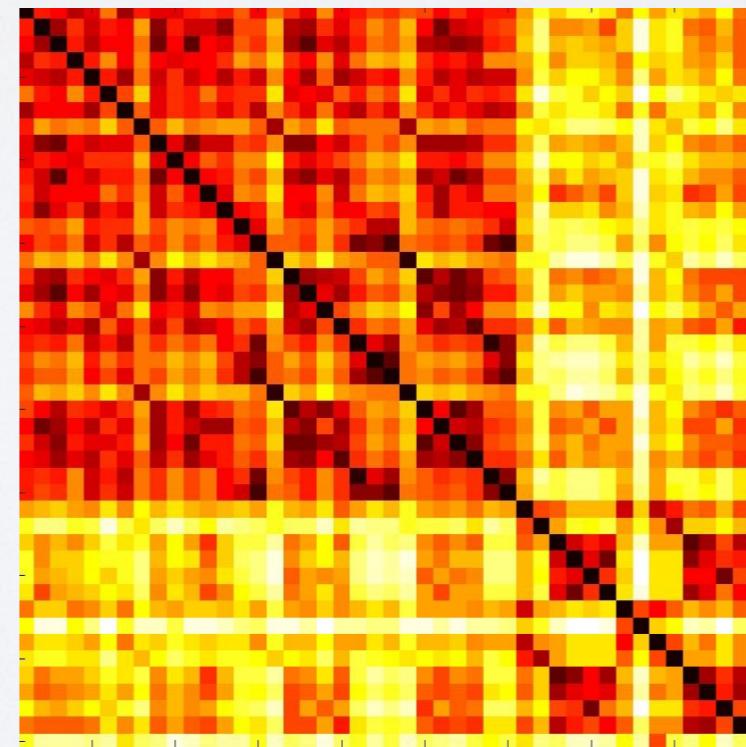
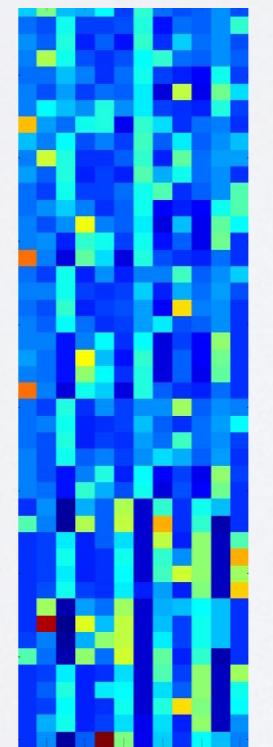
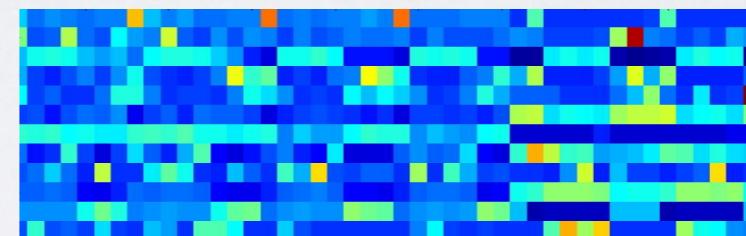
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AUDIO FEATURE EXTRACTION

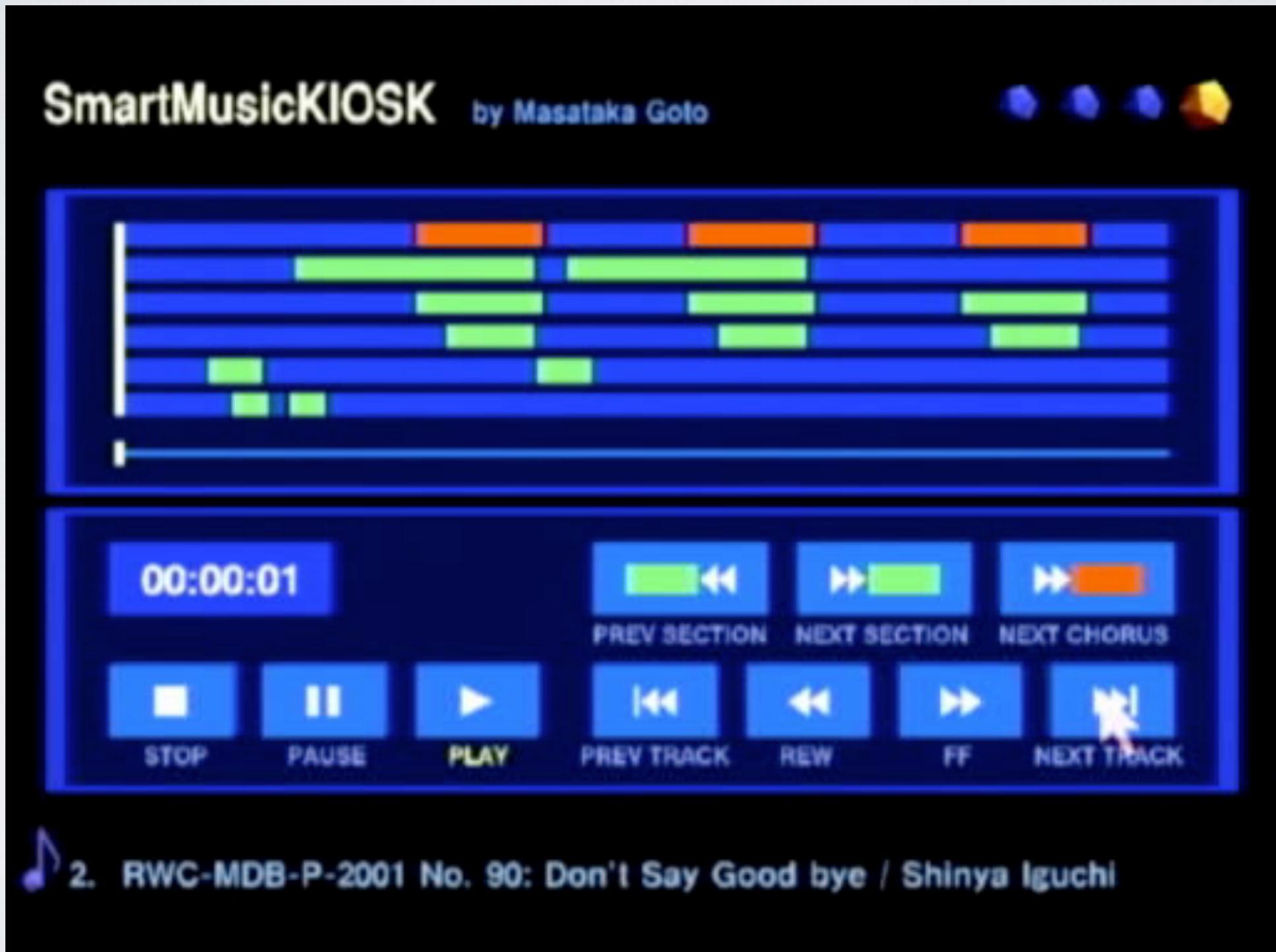
- To do:
 - demonstrate audio spectrum analysis using Sonic Visualiser
 - show log scaling
 - mention Pythagoras, who founded music theory and science with a single stroke

STRUCTURAL ANALYSIS

- Goal: find large-scale sections from audio



STRUCTURAL ANALYSIS



Masataka Goto, SmartMusicKIOSK: Music-playback interface based on chorus-section detection method, The Journal of the Acoustical Society of America, Vol. 15, No. 5, Pt. 2, p. 2494, May 2004. (Invited Paper of The 147th Meeting of the Acoustical Society of America)

MINI-APPLICATION: STRUCTURE

automashupper

AutoMashUpper by Matthew Davies, Philippe Hamel Kazuyoshi Yoshii and Masataka Goto (AIST)

load song reset quit save

input - adamstark track01a

skip bwd play mix stop skip fwd

mashup visualizer

segmentation level

key shift range +/- 2
tempo range +/- 30%
harmonic weight 1
rhythmic weight 0.2
loudness weight 0.2

song library load new library

selected songs

198. ALEJANDROMASAFRET.Bass

(initial order)

change to selection
auto mashup! add to mashup
delete from mashup

select all pick 10 clear

more mashup | more input
playback balance

current section : 4 current beat : 80

input is segmented at harmonic change points

ECHO NEST REMIX

- Gives full rhythmic and structural analysis
- Enables automatic remixing
- Example: Girl Talk in a box

SUMMARY

- Music Information Retrieval includes:
 - retrieving musical documents from queries
 - interpreting social data about music
 - extracting information from music
- ...and you can do it!

THANK YOU!