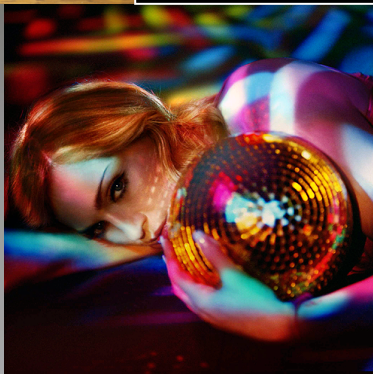




Exploring “Artist Image”  
Using Content-Based Analysis  
of Promotional Photos



Jānis Lībeks & Douglas Turnbull  
Swarthmore College  
June 2, 2010



Similar “Image”  Similar Music

Promo Photos



Genre Tags

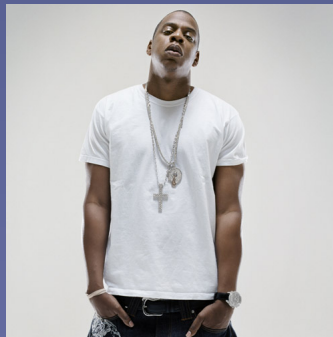
pop



metal

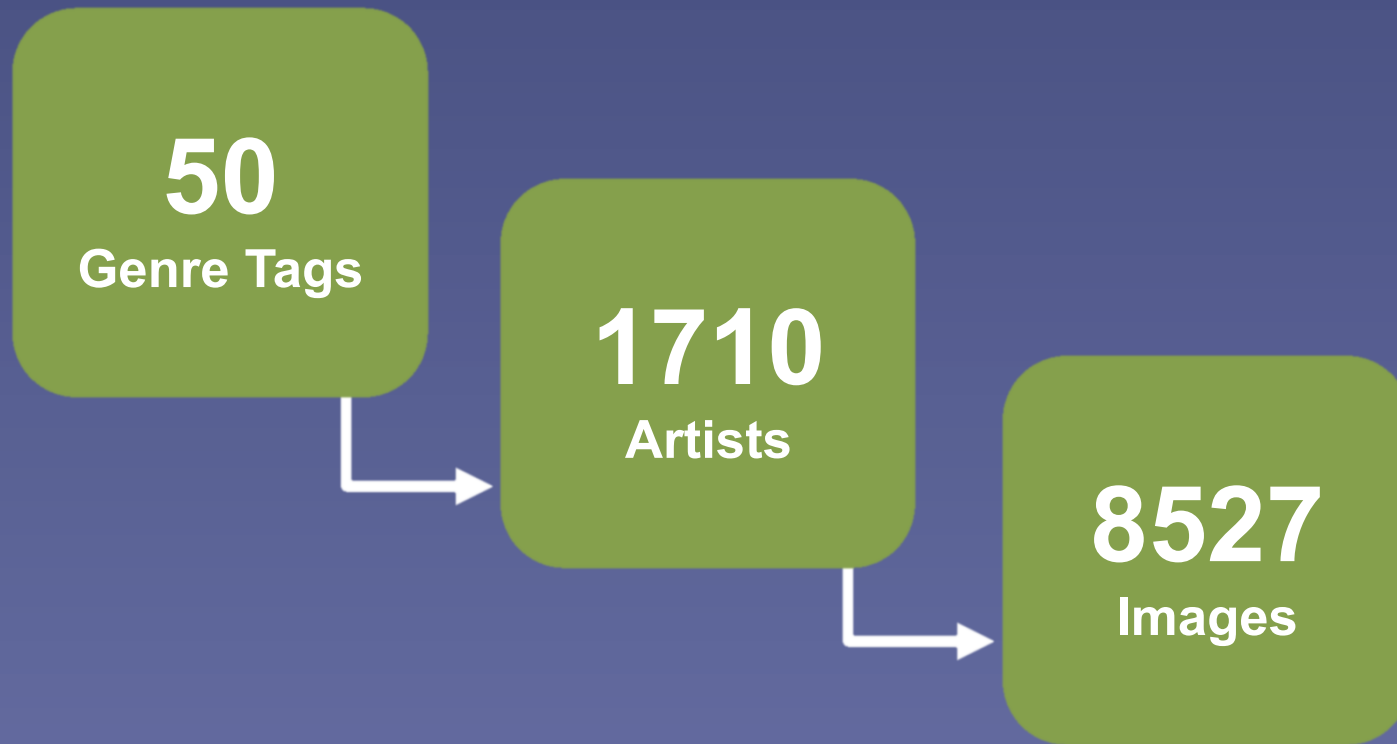


rap



# Experiment

Data from **last.fm**<sup>™</sup>  
the social music revolution



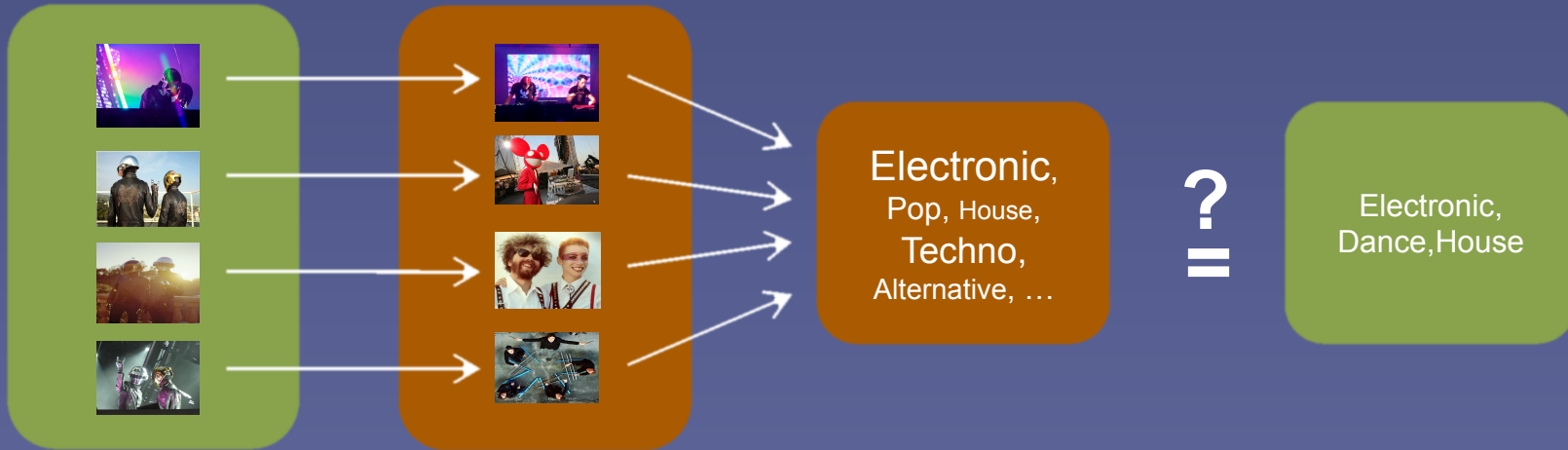
# Methodology

Images for  
Artist

Find Closest  
Images

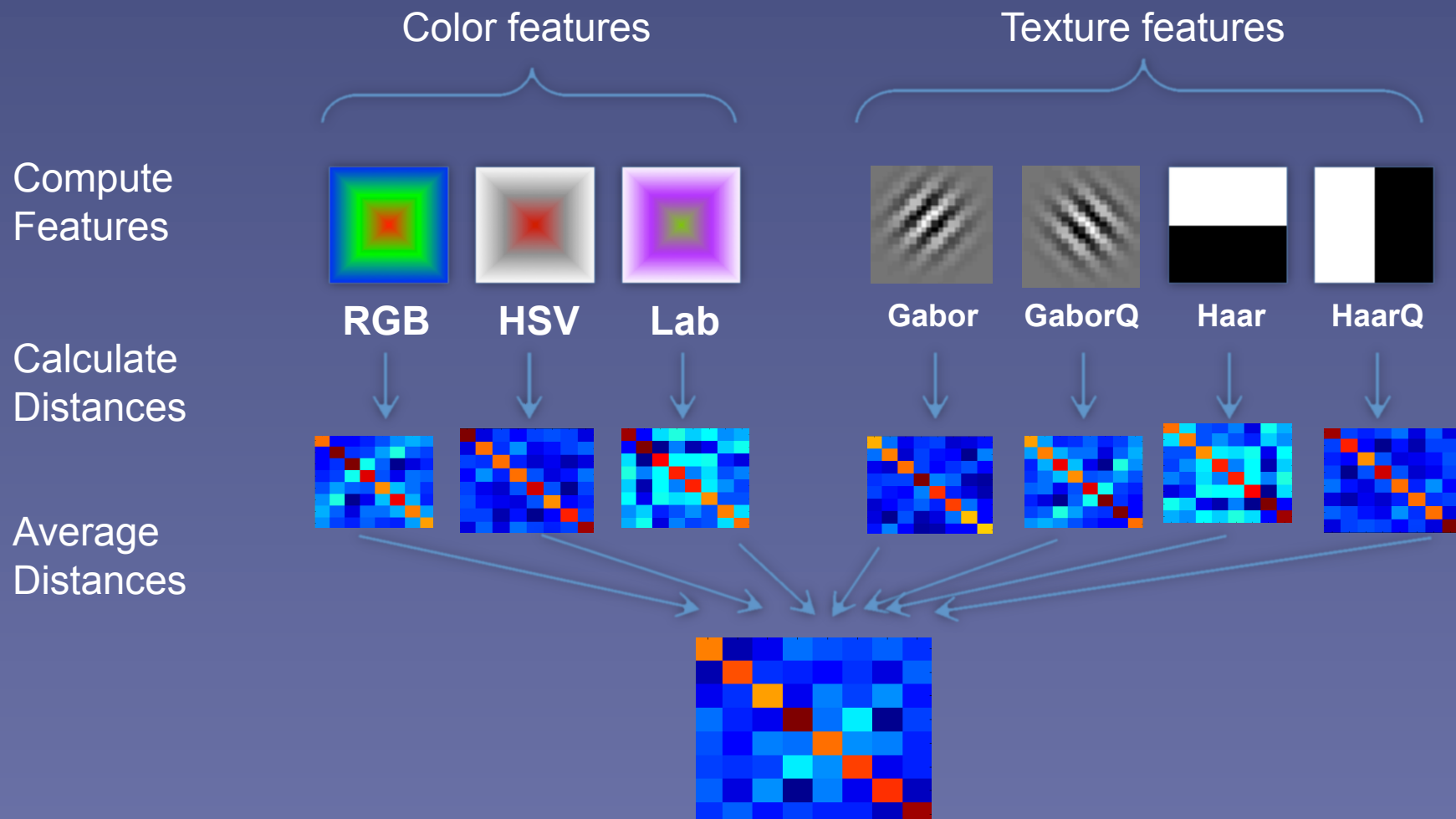
Propagate  
Tags

Evaluate  
Prediction



# Image Similarity Measure

- Makadia, Pavlovic, Kumar [2008] baseline measure.

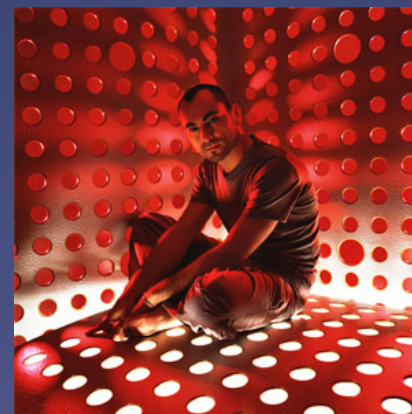




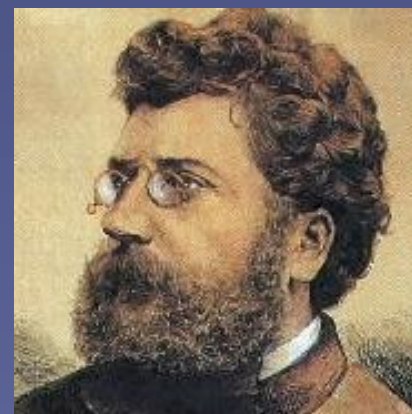
Artist Image



Color Similarity



Texture Similarity



Color and Texture Similarity





Daft Punk



Astral Projection

Deadmau5

Eurythmics

Einstürzende Neubauten

Predicted Tag Score

Truth Tags

electronic

1

1

1

1

1

1

dance

0

1

1

0

1/2

1

pop

0

0

1

0

1/4

0

house

0

1

0

0

1/4

1

classical

0

0

0

0

0

0

# Evaluation

- 1) For each Artist, predict tag score.
  - a) Calculate Image Similarity
  - b) Propagate Tags
  
- 2) For each tag, rank artists by predicted tag score.
  - 1) Calculate the **Area Under the ROC Curve (AUC)**
    - Random Ranking = 0.5
    - Perfect Ranking = 1.0

	AUC
Random	0.50
50 Tag Average	<b>0.59</b>
(43 of 50 Tags better than Random)	
Melodic Death Metal	0.70
Metal	0.69
Dance	0.64
Indie Pop	0.63
Blues, Classic Rock, Rap, Psychodelic, Folk, Country, Funk	< 0.54

# Conclusions

Using content-based image annotation,  
we **CAN** predict genre tags for an artist.

The “**image**” of an artist is useful for  
determining **music similarity**.

# Q: But why?

## Björk ON TOUR

51,273,966 plays (1,318,460 listeners)  
1,502 plays in your library

Listening now: [Lovenviolins](#), [Podo-Podo](#)  
11,324 shouts

Tag Share

### Reykjavík, Iceland (1979 – present)

Björk Guðmundsdóttir (born 21 November 1965) is an Icelandic [singer-songwriter](#), [composer](#), music [producer](#), and occasional actress, whose work includes six solo albums and two film soundtracks.

She is best known for her expressive vocals, broad soprano vocal range, and a diverse and electronic musical style which incorporates influences from many different genres, including [industrial](#), [pop](#), [alternative rock](#), [jazz](#), [ambient](#), [electronic](#), [classical](#), [folk](#) and [trip hop](#). She is also known for her eccentric costumes and music videos. Her singles "[It's Oh So Quiet](#)", "[Army Of Me](#)" and "[Hyperballad](#)" all charted in the UK Top 10.

[Read more...](#) [Edit](#)



[See all 1,053 pictures](#)

Play Björk Radio

PANDORA®  
internet radio register | sign in

Help

Register for FREE to save your stations and access Pandora anytime, anywhere. [register now](#)

share

Create a New Station...

Your Stations

**Roisin Murphy Radio**  
add variety... | options

Ramalama (Bang Bang)  
by: Roisin Murphy  
on: Ruby Blue

Little Bit  
by: Lykke Li  
on: Little Bit [EP]

They  
by: Jem  
on: Finally Woken

QuickMix

Who made up all the rules  
We follow them like fools  
Believe them to be true  
Don't care to think them through  
[full lyrics...](#)

# A: Music Discovery

## Similar Artists



Pnau



Cut Copy



Miami Horror



Ladyhawke



Miike Snow



MGMT



Midnight  
Juggernauts

[See more](#)



### Chromeo

5,632,076 plays (313,438 listeners)

[Only 3 plays in your library](#)

[electronic](#), [electro](#), [funk](#), [dance](#), [electronica](#)

Chromeo is an electrofunk duo based in Montreal, Canada and New York City. They are P-Thugg, on keyboards, synthesizers and talk box, and Dave 1 (David Macklovitch) on guitar and lead vocals. The two were best friends since childhood and officially formed the band in 2002.

[Read more](#)

### Similar Artists from Your Library



**Sam Sparro**  
(132 plays)



**Simian Mobile  
Disco**  
(332 plays)



**Cut Copy**  
(47 plays)



**Midnight  
Juggernauts**  
(64 plays)



**Calvin Harris**  
(118 plays)



Since ICMC submission...

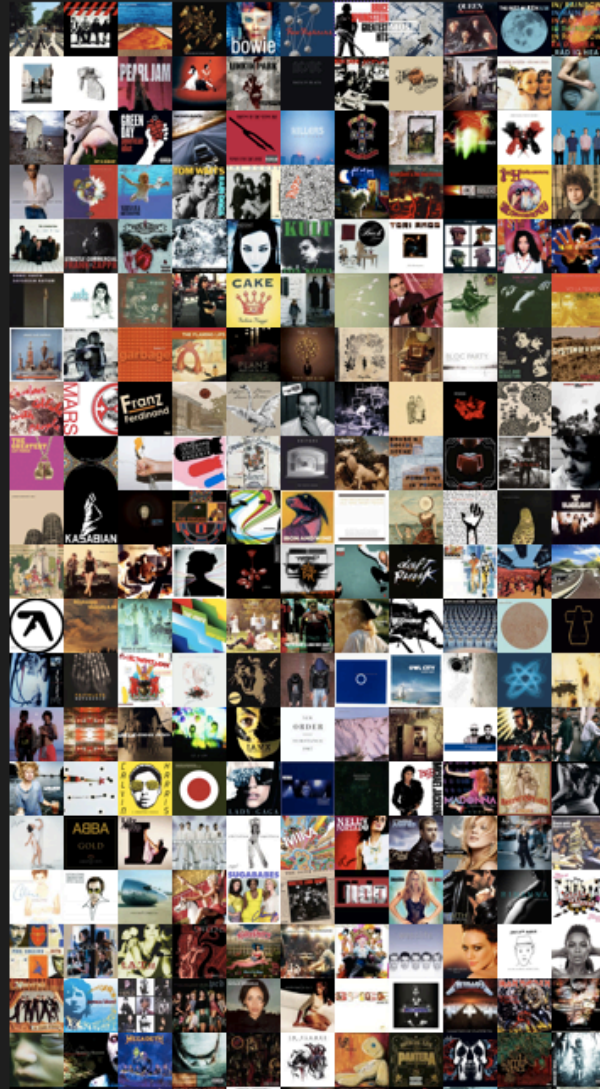
- Also explored **Album Covers**
- Conducted **Human Study**
- **Main Result:** Our system performs almost as well as humans when they do not recognize the artist.
- Built **Artist Image Browser (AIB)**

# AIB

Artist Image Browser

- Main Page
- Browse by Image**
- Browse by Artist Name
- Browse by Genre Tag
- Publications
- Details

## Album Covers



## Promotional Photos



# AIB

Artist Image Browser

Main Page

Browse by Images

Browse by Artist Name

Browse by Genre Tag

Publications

Details

### Image Type:

Promotional Photos

Album Covers

### Similarity Measure:

Both color and texture

Color Only

Texture Only

# Aphex Twin

Find this artist on [lost.fm](http://lost.fm)

Tags for Aphex Twin

electronic, ambient, experimental, electronica, techno, electro

Predicted tags

metal, electronic, thrash metal, post-rock, hard rock, etc.

Aphex Twin's photo

Closest photo

Tags in common with Aphex Twin

Tags different from Aphex Twin



Steve Roach

ambient, electronic, experimental, electronica

chillout



Fatboy Slim

electronic, electronica, techno

dance, house, alternative, rock

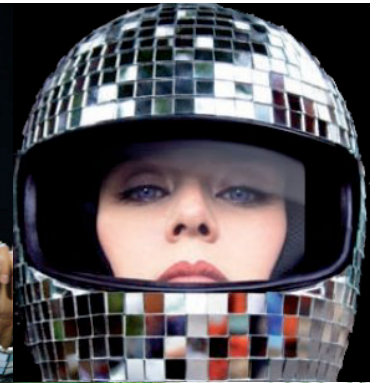


Godsmack

hard rock, metal, rock, alternative, heavy metal, alternative rock



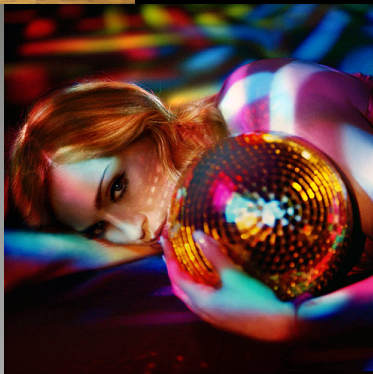
thrash metal, metal



**Thank You**



**libeks@gmail.com**  
**<http://web.cs.swarthmore.edu/aib>**



# Album Covers

Tag	Area under ROC curve
random selection	0.50
classical	0.74
metal	0.73
black metal	0.72
power metal	0.71
death metal	0.70
heavy metal	0.66
pop	0.65
dance	0.63
trip-hop	0.63



Tag	Area under ROC curve
random selection	0.50
jazz	0.56
soul	0.56
techno	0.55
progressive rock	0.54
emo	0.54
reggae	0.54
funk	0.51
blues	0.50
country	0.45

# Tags Vocabulary

alternative	alternative rock	ambient	black metal	blues
chillout	classic rock	classical	country	dance
death metal	electro	electronic	electronica	emo
experimental	folk	funk	hard rock	hardcore
heavy metal	hip hop	hip-hop	house	indie
indie pop	indie rock	industrial	jazz	melocid death metal
metal	metalcore	new wave	pop	post-rock
power metal	progressive metal	progressive rock	psychedelic	punk
punk rock	rap	reggae	rnb	rock
soul	techno	thrash metal	trance	trip hop