MIR User Studies through the Lens of Relevance Promoting the Impact of MIR User Research

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Challenges limiting the impact of MIR user studies (as per Lee & Cunningham, 2013)

♪ Limitations of sample size and sampling strategy challenge generalizability
♪ Difficulty of systematic synthesis due to highly diffuse publication venues
♪ Disconnect between user researchers and system / evaluation task designers
♪ Fast changing nature of the MIR field, user behaviours, and expectations

How have we addressed these challenges?

♪ Triangulate findings of different studies using a shared conceptual framework
♪ Reuse Lee & Cunningham's list of 159 articles for our systematic analysis
♪ Provide access to all findings, queryable according to design task descriptors
♪ Encourage MIR user researchers to contribute new findings to our corpus

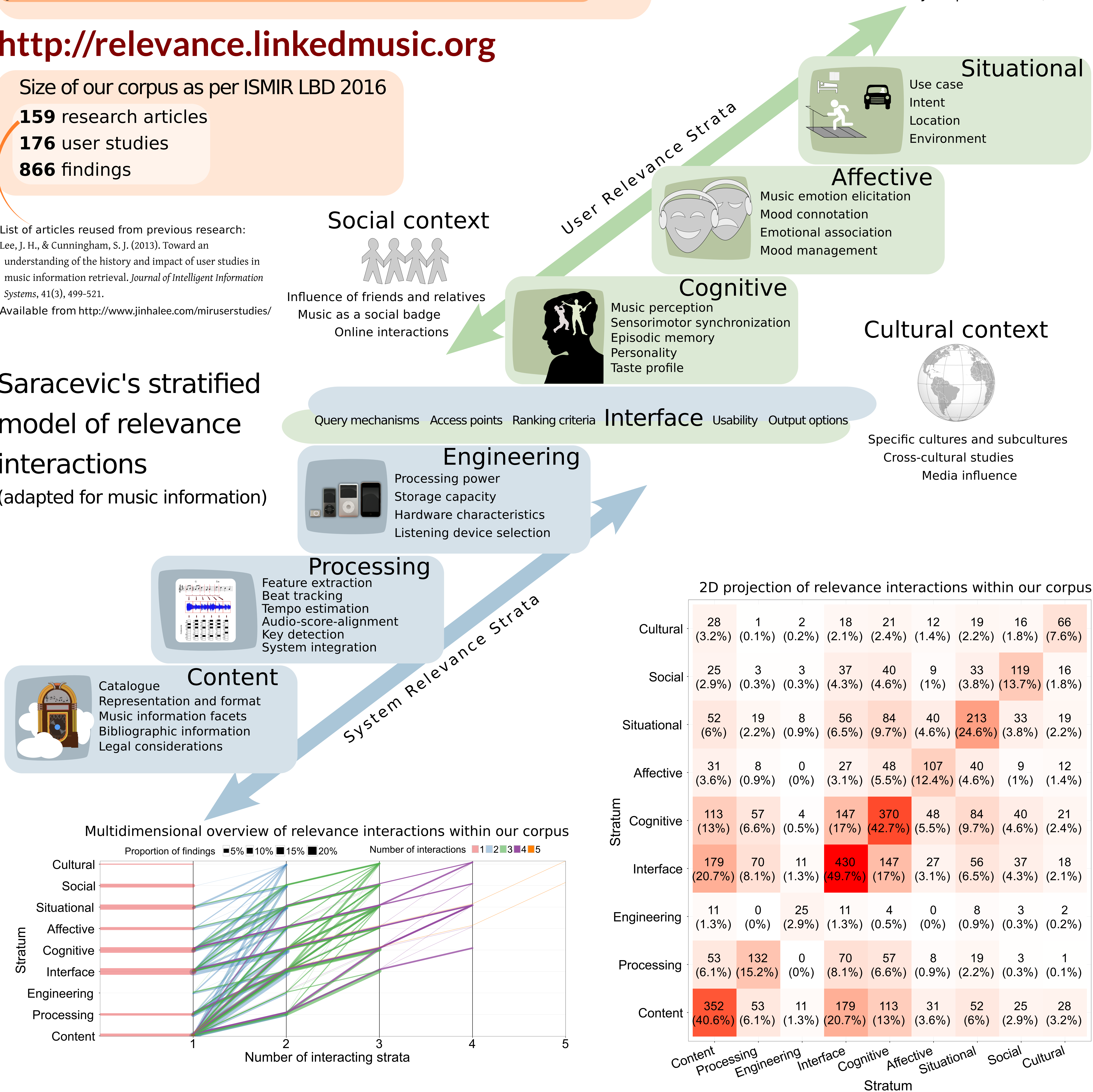# http://relevance.linkedmusic.org

Size of our corpus as per ISMIR LBD 2016

159 research articles
176 user studies
866 findings

List of articles reused from previous research:
Lee, J. H., & Cunningham, S. J. (2013). Toward an understanding of the history and impact of user studies in music information retrieval. *Journal of Intelligent Information Systems*, 41(3), 499-521.
Available from http://www.jinhalee.com/miruserstudies/

Why relevance?

Relevance is a, if not even *the*, **key notion** in information science in general and **information retrieval** in particular.

- Tefko Saracevic, 2007

"The creation of **rigorous** and **practicable theories** concerning the nature of experiential similarity and **relevance** is the single most **important challenge** facing MIR researchers today."

- J. Stephen Downie, 2003

Saracevic's stratified model of relevance interactions
(adapted for music information)

Situational
Use case
Intent
Location
Environment

Affective
Music emotion elicitation
Mood connotation
Emotional association
Mood management

Cognitive
Music perception
Sensorimotor synchronization
Episodic memory
Personality
Taste profile

User Relevance Strata

Social context
Influence of friends and relatives
Music as a social badge
Online interactions

Cultural context
Specific cultures and subcultures
Cross-cultural studies
Media influence

Query mechanisms   Access points   Ranking criteria   **Interface**   Usability   Output options

Engineering
Processing power
Storage capacity
Hardware characteristics
Listening device selection

Processing
Feature extraction
Beat tracking
Tempo estimation
Audio-score-alignment
Key detection
System integration

Content
Catalogue
Representation and format
Music information facets
Bibliographic information
Legal considerations

System Relevance Strata

Multidimensional overview of relevance interactions within our corpus

Proportion of findings ■5% ■10% ■15% ■20%   Number of interactions ■1 ■2 ■3 ■4 ■5

Stratum (y-axis): Cultural, Social, Situational, Affective, Cognitive, Interface, Engineering, Processing, Content
Number of interacting strata (x-axis): 1 2 3 4 5

2D projection of relevance interactions within our corpus

Stratum	Content	Processing	Engineering	Interface	Cognitive	Affective	Situational	Social	Cultural
Cultural	28 (3.2%)	1 (0.1%)	2 (0.2%)	18 (2.1%)	21 (2.4%)	12 (1.4%)	19 (2.2%)	16 (1.8%)	66 (7.6%)
Social	25 (2.9%)	3 (0.3%)	3 (0.3%)	37 (4.3%)	40 (4.6%)	9 (1%)	33 (3.8%)	119 (13.7%)	16 (1.8%)
Situational	52 (6%)	19 (2.2%)	8 (0.9%)	56 (6.5%)	84 (9.7%)	40 (4.6%)	213 (24.6%)	33 (3.8%)	19 (2.2%)
Affective	31 (3.6%)	8 (0.9%)	0 (0%)	27 (3.1%)	48 (5.5%)	107 (12.4%)	40 (4.6%)	9 (1%)	12 (1.4%)
Cognitive	113 (13%)	57 (6.6%)	4 (0.5%)	147 (17%)	370 (42.7%)	48 (5.5%)	84 (9.7%)	40 (4.6%)	21 (2.4%)
Interface	179 (20.7%)	70 (8.1%)	11 (1.3%)	430 (49.7%)	147 (17%)	27 (3.1%)	56 (6.5%)	37 (4.3%)	18 (2.1%)
Engineering	11 (1.3%)	0 (0%)	25 (2.9%)	11 (1.3%)	4 (0.5%)	0 (0%)	8 (0.9%)	3 (0.3%)	2 (0.2%)
Processing	53 (6.1%)	132 (15.2%)	0 (0%)	70 (8.1%)	57 (6.6%)	8 (0.9%)	19 (2.2%)	3 (0.3%)	1 (0.1%)
Content	352 (40.6%)	53 (6.1%)	11 (1.3%)	179 (20.7%)	113 (13%)	31 (3.6%)	52 (6%)	25 (2.9%)	28 (3.2%)

Stratum