

Jazz Databases: Weimar Jazz Database and Dig That Lick

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Hochschule für Musik
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Dig That Lick

The *Jazzomat* Project (2012-2017)

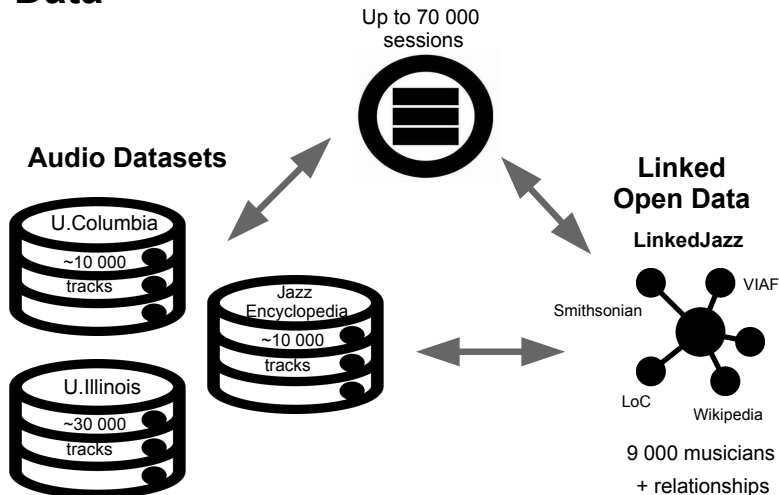
- Background to the *Dig That Lick* project
- Martin Pfeleiderer, Klaus Frieler, Jakob Abeßer at the University of Music Franz Liszt Weimar
- Investigation of jazz improvisation
- Produced the **Weimar Jazz Database**:
 - 456 transcriptions of monophonic solos from well-known musicians
 - Aligned to audio, chords, beats
 - Released as an SQL database
- Accompanying software MeloSpySuite provides analysis of data
- JazzTube links to YouTube audio recordings for some tracks




The *Dig that Lick* Project (2017-2019)

- Full title: *Dig that lick: Analysing large-scale data for melodic patterns in jazz performances*
- **Infrastructures** for large-scale semantic audio analysis
- **Interfaces** for selection, analysis, and aggregation
- **Analysis** of melodic patterns in a large jazz corpus
- **Link** to metadata
- **Interpret** evidence of musical influence

Data

Discographies



- Analysis of collections from two music libraries (30k + 10k tracks) and the Jazz Encyclopedia box set (10k tracks)
- Automatic transcription of main melody (solo part)
 - Orig:  Est:  Mix: 
- Melodic patterns extracted as n-grams
 - Criteria: multiple instances, tracks, performers
 - Exact or inexact matching with string edit distance



The Metadata Bottleneck

- Who is soloing now?
- Audio obtained from music libraries included only: Label, Catalog number, Artist, CD title, Track title
- Semiautomatic matching to Lord's Jazz Discography, MusicBrainz and Discogs provided much richer data (full lineup, dates, places)
- Jazz Encyclopedia had all this, already digitised in a CSV file (!)
- For high quality, human effort is hard to avoid

(Automatic) Metadata Cleaning

Named Entity Resolution

Charlie Parker	39805	b
Charley Parker	3371	el-b
Чарли Паркер	76	synt-b
Charlie “Bird” Parker	70	fretless-b
Charlie Parker and Dizzy Gillespie	10	string-b
Charlie Parker Quartet	9	fretless-el-b
Charlie Parker Quintet	8	el-fretless-b
Charlie Parker and his Orchestra	8	keyboard-b
Charlie Parker All Stars	5	amplified-b
	4	bass

ca. early spring 1946

Disambiguation

Bill Evans (p) \neq Bill Evans (ss)

Reconciliation

Armstrong, Louis, 1901-1971

Armstrong, Louis, 1900-1971

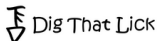
The *DTL1000* Dataset

- 1000 tracks selected randomly from jazz collections (100 per decade from 1920-2019)
- Note tracks automatically extracted from monophonic solos
- 1700 solos, 6M pitch n-gram instances, 5.6M interval n-grams
- Metadata expressed in RDF using a bespoke ontology and accessed via SPARQL requests
- Metadata used to filter searches and shown in results
- Similarity search combines DTL1000 with the Weimar Jazz Database, Charlie Parker Omnibook and Essen Folk Song Collection
- Prereleased on <https://osf.io/buxvr/>

The *JazzDAP* Project (2021-2023)

- New Directions in Digital Jazz Studies: Music Information Retrieval and AI Support for Jazz Scholarship in Digital Archives
- UK (AHRC) and US (NEH) funded collaboration including the Institute of Jazz Studies (Rutgers) and the Scottish Jazz Archive
- Dataset release (transcriptions, linking to lead sheets and metadata) planned for 2023

Pattern Search: List Results



Switch to **Pattern search**

[New search](#) | [All searches](#) | [Documentation](#) | [Help](#) | [About](#) | [Print](#) | [Login](#)

Pattern Similarity Search



Similarity search

Pattern

-1,-2,-1,3,3,3,-1,-2

Transformation

Semitone Intervals

Pin pattern elements

First Last

Search

Options

Minimum similarity (80%)



Maximum length difference

2

Maximum edit distance

1

Minimum frequency

2

Keep overlapping instances

Within single phrase

Preserve contour (ascending)

Preserve pitch range (9)

Databases

Dig That Lick

Metadata filter

Weimar Jazz Database

Metadata filter

Charlie Parker Omnibook

EsAC Folksong Database

Found 82 similar (15 unique) pattern instances:

(44) (38)



#	Pattern	Performer	Title	Recording year	Instrument	Style	Similarity	Edit distance	
1	-1,-2,-1,3,3,3,-1,-2 (8)								
		Abraham Burton	Without a song	2013	Tenor saxophone	Hardbop	1.00	0	
		Art Pepper	How high the moon	1980	Alto saxophone	Cool	1.00	0	
		Charlie Parker	Donna Lee	1947	Alto saxophone	Bebop	1.00	0	
		Charlie Parker	Ko-Ko	1945	Alto saxophone	Bebop	1.00	0	
		Dexter Gordon	Cheese Cake	1962	Tenor saxophone	Hardbop	1.00	0	
		Dexter Gordon	Society Red	1961	Tenor saxophone	Hardbop	1.00	0	

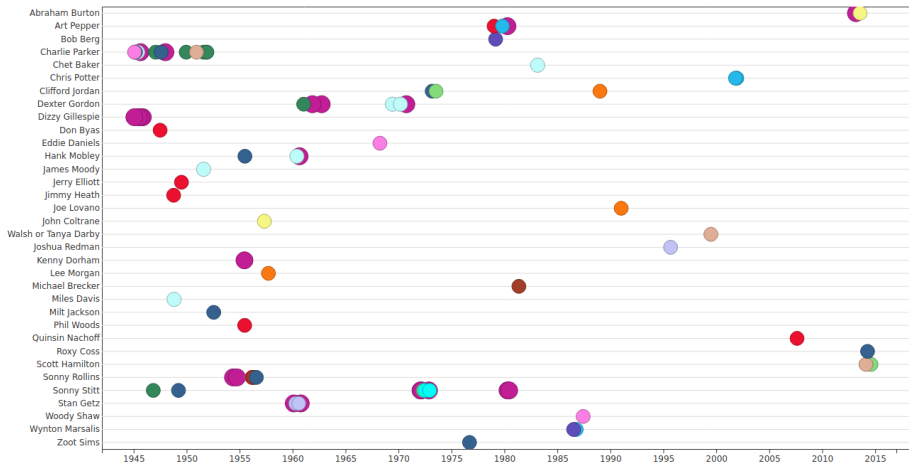
Show columns

Raw frequency Pitch range Contour Start position Duration

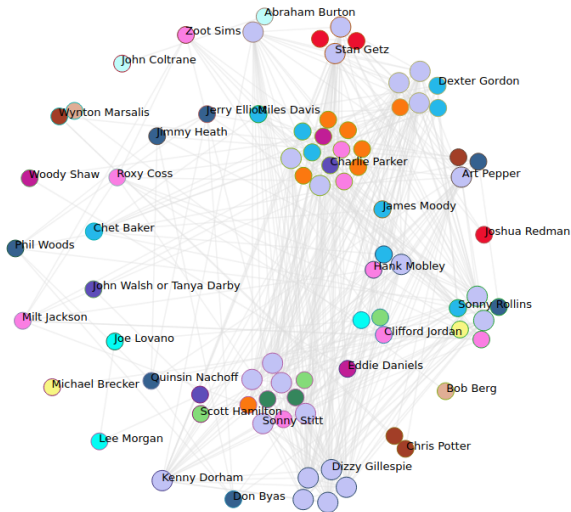
Group by

Pattern Performer

Pattern Similarity Search: Timeline Results



Pattern Similarity Search: Network Results



Publications and Presentations

- Başaran, D., Essid, S., and Peeters, G. (2018). Main melody estimation with source-filter NMF and CRNN. In *19th International Society for Music Information Retrieval Conference*, pages 82–89.
- Frieler, K. (2019). Constructing jazz lines: Taxonomy, vocabulary, grammar. In M. Pfeleiderer, W.-G. Z., editor, *Jazzforschung heute: Themen, Methoden, Perspektiven*, pages 103–132. Edition EMVAS, Berlin.
- Frieler, K., Başaran, D., Höger, F., Crayencour, H.-C., Peeters, G., and Dixon, S. (2019a). Don't hide in the frames: Note- and pattern-based evaluation of automated melody extraction algorithms. In *6th International Conference on Digital Libraries for Musicology*, pages 25–32.
- Frieler, K., Höger, F., and Pfeleiderer, M. (2019b). Anatomy of a lick: Structure and variants, history and transmission. In *Book of Abstracts of the Digital Humanities Conference*.
- Frieler, K., Höger, F., and Pfeleiderer, M. (2019c). Towards a history of melodic patterns in jazz performance. In *6th Rhythm Changes Conference*.
- Frieler, K., Höger, F., Pfeleiderer, M., and Dixon, S. (2018). Two web applications for exploring melodic patterns in jazz solos. In *19th International Society for Music Information Retrieval Conference*, pages 777–783.
- Gabbard, K. (2019). What we are digging out of the data? In *6th Rhythm Changes Conference*.
- Henry, L., Frieler, K., Solis, G., Pfeleiderer, M., Dixon, S., Höger, F., Weyde, T., and Crayencour, H.-C. (2023). Dig that lick: Exploring patterns in jazz with computational methods. *Jazzforschung / Jazz Research*, 50/51:to appear.
- Höger, F., Frieler, K., Pfeleiderer, M., and Dixon, S. (2019). Dig that lick: Exploring melodic patterns in jazz improvisation. In *20th International Society for Music Information Retrieval Conference: Late Breaking Demo*.
- Pfeleiderer, M., Frieler, K., Abeßer, J., Zaddach, W.-G., and Burkhart, B., editors (2017). *Inside the Jazzomat: New Perspectives for Jazz Research*. Schott Campus.
- Proutskova, P., Wolff, D., Fazekas, G., Frieler, K., Höger, F., Velichkina, O., Solis, G., Weyde, T., Pfeleiderer, M., Crayencour, H. C., Peeters, G., and Dixon, S. (2022). The Jazz Ontology: A semantic model and large-scale RDF repositories for jazz. *Journal of Web Semantics*, 74:100735.
- Solis, G. and Henry, L. (2019). Chasing the Trane: Quantifying the social journey of a Coltrane solo. In *6th Rhythm Changes Conference*.
- Weyde, T., Wolff, D., Dixon, S., Proutskova, P., Crayencour, H.-C., Smith, J., Peeters, G., and Başaran, D. (2019). Dig that lick: A technical primer for big data jazz studies. In *6th Rhythm Changes Conference*.

Acknowledgements



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