



Tracing the creative process

A case study of Bob Berg's solo on "Angles"

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Introduction

- In this case study, we try to reconstruct the creative process with means of computational and statistical tools.
- Data from the Weimar Jazz Database (Frieler et al., 2012).
- Analysis done with MeloSpyGUI & R.

General Description

- Bob Berg (1951–2002), was an eminent postbop tenor sax player of Miles Davis fame, from Brooklyn, New York.
- "Angles" is an Bob Berg original from his 1993 record "Enter the Spirit" (Stretch Records STD-1105).
- Personnel: Bob Berg (ts), David Kiskoski (p), James Genus (b), Dennis Chambers (dr).

Tempo	270 bpm
Signature	4/4
Key	Indeterminate, between Ab-maj and C-min.
Form	A(16) A(16) B(16)
Rhythm feel	A: Latin, B: Swing
Lengths	799 tones, 144 bars, 3 choruses, 8 phrases
Duration	127 s
Densities	6.3 tones/sec, 5.6 tones/bar, 21 tones/phrase
Metrical centroid	3+
Start of phrases	42% (beat 3), 13% on 3+, 10% on 1, 10% on 2+
Syncopicity	9.2% (very few)
Ambitus	as-as" (36 semitones / 3 octaves)

Tab. 1: Global statistics of Berg's solo on Angles.

Fig. 1: Transcription of Berg's solo with annotated mid-level units and assorted pitch patterns.

Dramaturgy

- Overall wave-like ascending tension curve (Fig. 2).
- Number of expressive ideas (**oscillations**, **expressive**), loudness, intervals, and contrasts increase over time (Fig. 2 & 4).
- Highest tonal tension at end of choruses on G7#9/D7alt turnaround.

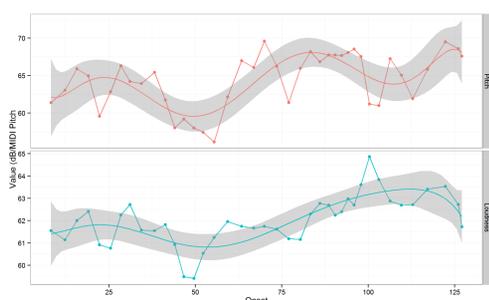


Fig. 2: Pitch and loudness curves, smoothed with N=40 window, polynomial fit of degree=7.

Mid-level Analysis

- Qualitative annotation of "playing ideas" (Frieler et al., 2016).
- MLA Stats:
 - 51 units, 15 glued, 13 derived (mostly immediate).
 - Mean duration 2.0 sec/2.75 bars.
 - Mostly **lines**, **rhythm** and **expressive** (Tab. 1).
 - Often across form boundaries (Fig. 2).
 - Lines can be classified roughly into arpeggios (6/21), diatonic (4/21), chromatic (3/21), and mixed (8/21).

	expressive	lick	line	melody	rhythm	Sum
Count	6	11	21	6	7	51
Tones	24	67	485	50	173	799
Duration (s)	12	9	56	10	19	106

Tab. 2: Distribution of mid-level units.

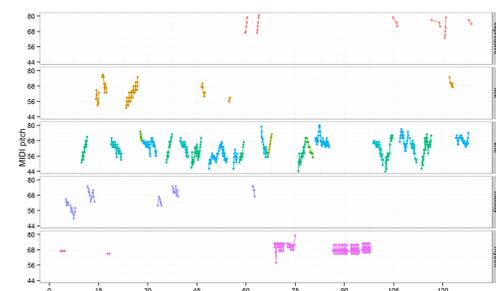


Fig. 4: Time course of solo with respect to main types of annotated mid-level units. Lines are colored according to sub-types.

Tonal material

Preference for upper structures, e.g., C-min/Abj7, G-7/C-7, F-7b5/Db7.

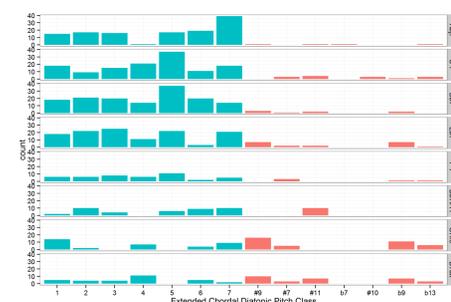


Fig. 5: Distribution of extended chordal pitch classes with respect to chords context.

Patterns

- Mainly lines contain longer pitch pattern, partly overlapping (Fig. 1), built itself from smaller particles.
- The longest 18-tone pattern (m. 31, m. 110) occurs also in „Nature of the Beast“ from the same record.
- Many interval patterns are actually pitch patterns (or octave transposed).
- Numerous tetrachord arpeggios (e.g., on the Db7 in the first chorus) and bebop-style four-tone motives (e.g., m. 20, m. 32, m.111).
- Pattern coverage with at least 4-tone patterns occurring in at least 10 solos of a total of 101 tenor solos: **pitch: 38%**, **cpc: 67%**, **interval: 93%**.

Conclusion & Outlook

- In an explorative pilot study, we tried to re-trace the creative process in a single jazz solo improvisation.
- Many details left out here due to space restrictions. More to come!

Chorus 1				Chorus 2				Chorus 3			
A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2
Abj7	C-7	Db7	Eb7	Abj7	C-7	Db7	Eb7	Abj7	C-7	Db7	Eb7
rhythm	mel	mel	line	mel	line	mel	line	mel	line	mel	line

Fig. 3: Distribution of mid-level units (bottom) over choruses (top, 48 bars each), form parts (upper middle, 16 bars each) and chords (lower middle, 4 bars each). (rhyth = rhythm, m/mel = melody, exp = expressive, lck = lick, blank = pauses).

References: Frieler, K., Pfeleiderer, M., Abeßer, J., & Zaddach, W.-G. (2016). "Telling a story". On the dramaturgy of monophonic jazz solos. *Empirical Musicology Review*, 11(1). Frieler, K., Pfeleiderer, M., Abeßer, J., & Zaddach, W.-G. (2016). Midlevel analysis of monophonic jazz solos. A new approach to the study of improvisation. *Musicae Scientiae*, 20(2). 143-162. Frieler, K., Abeßer, J., Zaddach, W.-G., & Pfeleiderer, M. (2013). Introducing the Jazzomat Project and the Melo(S)py Library. In: Kranenburg, P. van, Anagnostopoulou, C., & Volk, A. (Ed.) *Proceedings of the Third International Workshop on Folk Music Analysis*, Meertens Institute and Utrecht University Department of Information and Computing Sciences, pp. 76–78.