Tracing the creative process
A case study of Bob Berg’s solo on “Angles”
Klaus Frieler

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 on Bob Berg original from his 1993 record “Enter the Spirit” (Streetch Records STD-1105).
• Personnel: Bob Berg (ts), David Kiskoski (p), James Genus (b), Dennis Chambers (dr).

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).

<table>
<thead>
<tr>
<th></th>
<th>expressive</th>
<th>lick</th>
<th>line</th>
<th>melody</th>
<th>rhythm</th>
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<td>11</td>
<td>21</td>
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<td>56</td>
<td>10</td>
<td>19</td>
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</table>

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/Ab7?, G7-C7, F7b5/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 110 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!

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

References:

Website: https://jazzomat.hfm-weimar.de
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Fig. 1: Transcription of Berg’s solo with annotated mid-level units and assorted pitch patterns.

Fig. 1: Global statistics of Berg’s solo on Angles.

Fig. 6: Distribution of mid-level units (bottom) over choruses (top, 48 bars each), form parts (upper middle, 16 bars each) and choruses (lower middle, 4 bars each). (rhythm = rhythm, m/ceil = melody, expr = expressive, lick = lick, blank = pauses).

Fig. 6: Distribution of mid-level units (bottom) over choruses (top, 48 bars each), form parts (upper middle, 16 bars each) and choruses (lower middle, 4 bars each). (rhythm = rhythm, m/ceil = melody, expr = expressive, lick = lick, blank = pauses).