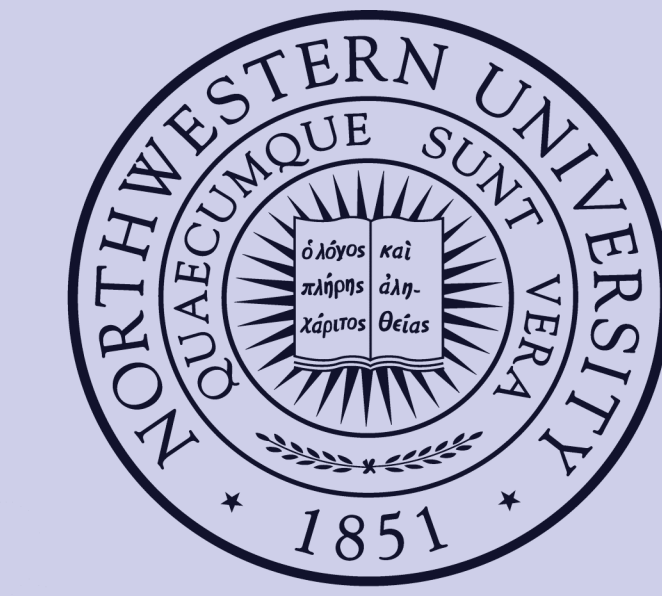


A Database for the Accommodation of Structural and Stylistic Variability in Improvised Jazz Piano Performances

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What it is

We have created a database of MIDI recordings performed by professional Chicago jazz pianists using lead sheets. These performers marked their performances with measure, beat and structural branch point information, encoded as MIDI data. A structural analysis of each performance has been created by a conservatory-trained professional jazz pianist. This database will be useful as training and validation data for a jazz score following program.

Motivation

Existing score following databases assume faithful performance of fully notated music. While current models may be effective for following notated "classical" music, they have little application for improvised music. Score following in jazz requires alignment of an improvised performance to a *lead sheet*, the basic template providing a song's melody, harmony and structural information. When playing standard jazz repertoire, it is not uncommon for jazz musicians to spontaneously alter aspects of the piece's pre-determined structure. For example, a trio of piano, bass and drums are playing a standard ballad with an "AABA" form. At the end of the final A section, the pianist plays a harmonic cadence that indicates a return to the B section. With the best live jazz musicians, this spontaneous structural change would be seamless. A program that follows the form of a jazz performance would depend on a flexible model that parses musical content in anticipation of possible structural change.

Study Design

Twelve pianists each gave three different performances scaled to three subjective levels of difficulty, ranging from a performance closely adhering to the given lead sheet to a more "free" interpretation that departs from the lead sheet. Our database contains a total of **36 performances** divided into 3 sets, constituting **12 performances for each of the jazz standards *Nica's Dream*, *Dindi* and *Without a Song*.**

The Marking Task

Fig. A: Lead Sheet excerpt

1. Pianist plays solo performance based on lead sheet (Fig. A).
2. Listening to the performance playback, pianist marks measure and beat information in real time using a MIDI touch pad.
3. Pianist marks performance with section (double bar line) information in real time.

Results

In comparing the musical information provided on a lead sheet with the marked performances of professional musicians, **we have identified structural and stylistic variables that a score-following program must take into account.** This database is available on request.

Three performances of each song

“strict” ← 1 — 2 — 3 → “loose”

Interpretation of lead sheet

Variations were identified by the investigator based on their relevance to locating the performer's place on a lead sheet (Fig. B). Other departures from the lead sheet, such as melodic and harmonic variations, have not been quantified. Variations were also identified when the performer departs from the convention of *head/solo/head*, with *head* referring to the statement of the melody.

Indicates the performance(s) in which the variation is present

Pianist number P1 P2 P3 P4

Variation from lead sheet

Fig. B: "Nica's Dream" lead sheet

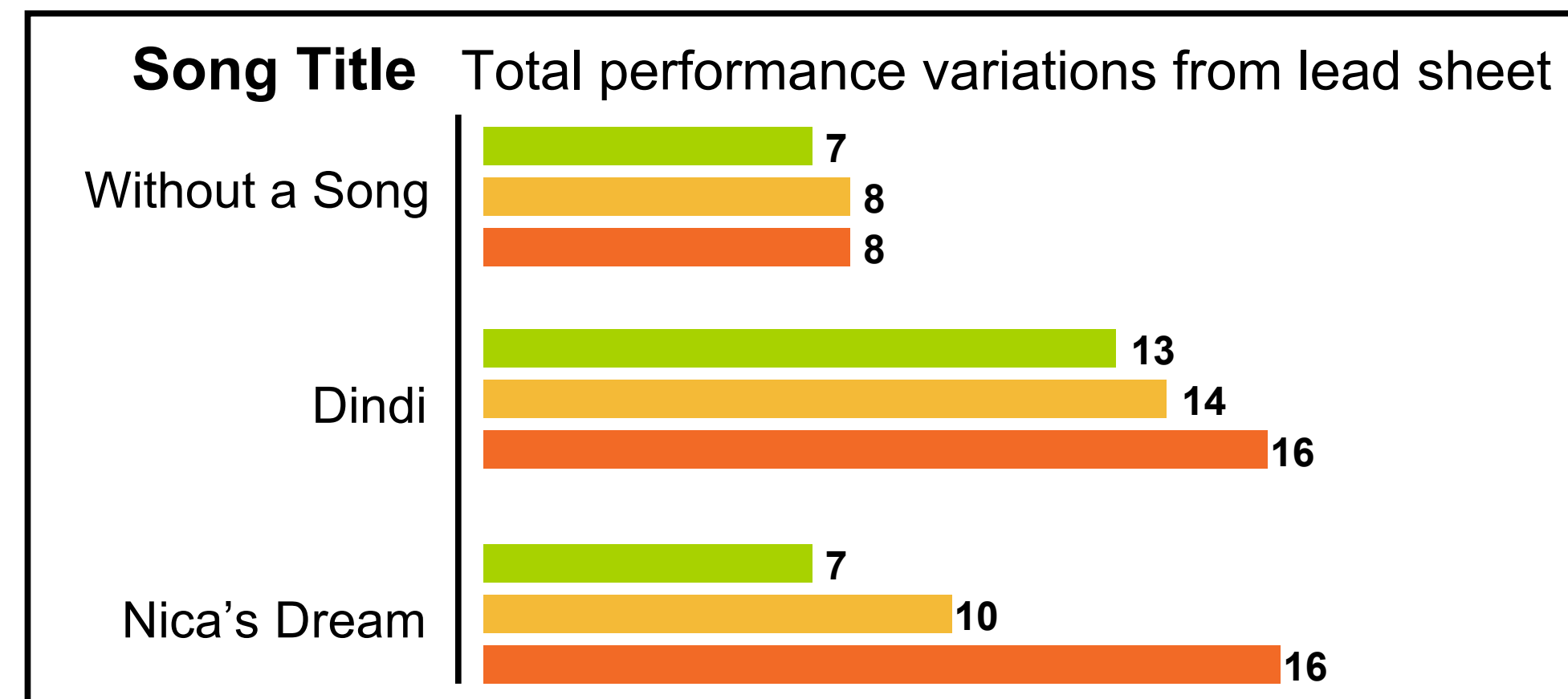
Performance variations in "Without A Song" by Rose and Eliscu

Omitted first statement of melody	Free improv w/o statement of melody or form	Improvised form variation	Added an Improvised coda	Added a beat to a measure	Portion of in-head A section played rubato
No improvised solo over song form	Removed measures from section	Melody only played at last half of out-head	Dropped beat	One or more sections left unmarked	Marking becomes off-track or lost

Marking variations

Observations

The performances obtained in our study represent a wide spectrum of possible structural patterns, ranging from a simple performance of the melody with no improvised solo to a completely improvised performance with no identifiable statement of the melody or song form.



Performance variations in "Dindi" by Antonio Carlos Jobim

Existing intro played rubato	Existing intro played in time	Improvised form variation	Added an Improvised coda	Removed measures from an A section
Solo played before intro	Dropped beat	Last melody statement played rubato	Added measures to an A section	Added improvised interlude

Note: no marking variations observed

Performance variations in "Nica's Dream" Horace Silver

Omitted intro	Added improvised interlude	Improvised form variation	Added an Improvised coda	Additional tag as bridge b/w melody and solo
Alternate, improvised intro	Dropped beat(s)	Removed measures from section	Repeated last 4 bars 2x	Intro played rubato
Used alternate time signatures (mixed meters)	Omitted B section	Portion of solo played rubato	Marking becomes off-track or lost	Marked in cut time

Marking variations

The structural variability in our corpus indicates that a score following program must take into account not only improvised **changes in section order**, but also architectural deviations such as **mixed meters** and possibly unintentional deviations such as **dropped or added beats**. Thus, a score following program must be able to determine the downbeat of an upcoming measure without relying the lead sheet's instructions. The proliferation of dropped and added beats in the recorded performances suggests a **flexible following system is needed to accommodate these alterations**.

The most common variations were the **improvised form variation and the improvised coda**. We also found that often the last section of the **final melody statement ("out-head") was often abridged** prior to an improvised coda.

We found that there is a **high level of departure from the lead sheet** even in performances intended as "strict" interpretations. As seen in the **chart below**, the number of identified variations in the "strict" performances is not always significantly lower than the number of variations in the "loose" performances.

To obtain access to database:

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More information: <http://music.cs.northwestern.edu>