Automatic Arrangement System Impersonating a Jazz Pianist
— Ba-Bi-Bun —

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Imagine you are at a jazz club in Manhattan. A spotlight is directed on a man sitting in front of a piano. He's gazing at a score in which only a simple melody and a chord progression are written. He starts playing a beautiful piano solo while looking at the score. The score, unlike a classical music score, does not prescribe all of the notes to be performed. Ba-Bi-Bun [1] is a musical system that arranges a piece like an improvising jazz pianist.

A jazz pianist's brain is stuffed with a rich vocabulary which he draws upon to play the piano, given a melody and a chord progression. Similarly, Ba-Bi-Bun is fed many cases beforehand, retrieves the cases most similar to the given melody and chord progression, and adapts them to create a performance.

Ba-Bi-Bun has two main features. One is that a given chord is described by its actual constituent notes, not by a chord symbol. A chord progression is very often written in a sequence of chord symbols. However, a chord symbol contains much ambiguity and cannot fully represent the true sound that a composer has intended. The direct representation by constituent notes of a chord avoids such ambiguity.

The other is that Ba-Bi-Bun interprets melodies and chord progressions from a musical point of view as a jazz pianist naturally does. When improvising, a jazz pianist would think, for example, that a note should be retained in an ad-lib phrase because it is prominent or that a phrase should be smoothly performed in a breath. These intentions based on interpretation of a score are not prescribed in the score at all. While playing, a jazz pianist always thinks of such things whether consciously or unconsciously. When Ba-Bi-Bun arranges a given melody and a chord progression, it first analyzes the surface description of a melody and a chord progression, finds the notes that are musically important and puts each part of the melody into a group. Then, it generates a new piece based on the results of the analysis.

Fig. 1 is a snapshot of an editor dedicated to the analysis of a score provided by a user. This can also be thought of as a wordprocessor for analyzing a piece. This editor enables us to coalesce a note with its neighboring notes and eventually make up a group of an entire piece. As an interpretation of music is varied one by one, the way of grouping depends on one's interpretation. Because Ba-Bi-Bun has the mechanism described above, it can well-arrange a melody and a chord progression and keep the atmosphere of the case used.
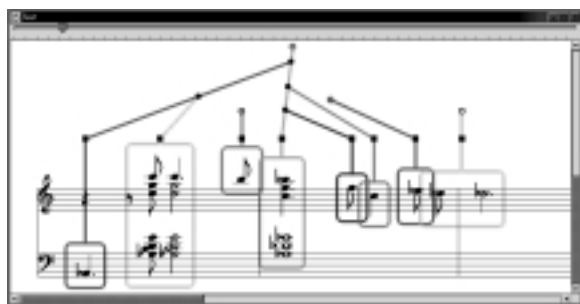

Fig. 1: Editor for Analysis

Let us return to the jazz club in Manhattan. A real jazz pianist often improvises unexpected yet cool passages in a flash. He can also enjoy interplay with a bassist and a drummer. Ba-Bi-Bun cannot achieve such advanced behavior at present, but Ba-Bi-Bun will continue to evolve and is expected to achieve human-like behavior in the future.

[1] Hirata, Aoyagi, Ba-Bi-Bun: Case-Based Reasoning Musical Arrangement System Understanding a User's Intention at Note Level, IPSJ SIGMUS, 2000-MUS-37, pp.17–23 (2000).