

# Representing Korean Traditional Musical Notation in XML

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## ABSTRACT

XML promises to provide a powerful interoperable general framework for the development of music representation systems. Unfortunately current XML encoding systems for music focus almost exclusively on Western music from the 17<sup>th</sup> century onwards, and on the Western notation system, Common Music Notation (CMN). This is regrettably limiting, with cultural, theoretical, and practical consequences for MIR. In order to ensure that music information retrieval (MIR) systems have full theoretic generality, and wide practical application, we have begun a project to explore the representation, in XML, of a genre of traditional Korean music which has a distinctive notation system called Chôngganbo. Our project takes seriously the specific notational expression of musical intention and intends to ultimately contribute to the analysis of theoretical issues in music representation, as well as to the improvement of methods for representing Korean music specifically.

## 1. INTRODUCTION

Our research objectives are to ensure that (i) the full spectrum of the world's musical culture is made available in the emerging electronic delivery systems, (ii) theories of music representation are tested by the a wide range of diverse data, and (iii) the retrieval techniques developed by the MIR community are broadly applicable, we have initiated a project to explore the encoding of traditional Korean music and notation.

## 2. WHAT DOES OUR ENCODING REPRESENT?

### 2.1 Conceptual Preliminaries

Any proposed music encoding project should explicitly declare exactly it intends to be an encoding *of*; that is, precisely, what sort of objects and relationships it is representing. We use three domains of the Standard Music Description Language (SMDL) (ISO 1995) to characterize the possibilities.

#### 2.1.1 *The Logical Domain (Musical intention)*

"The composer's intentions with respect to pitches, rhythms, harmonies, dynamics, tempi, articulations, accents, etc." (ISO 1995). It is the pure abstract musical content and as such it is deliberately and systematically indifferent to the features of particular scoring systems. SMDL focuses on this domain.

#### 2.1.2 *The Visual Domain (Scoring)*

Scoring is an expression of musical intention, typically in a

traditional language designed to communicate to performers. Languages for typesetting or formatting of musical scores are concerned with this domain.

#### 2.1.3 *The Gestural Domain (Performance)*

An acoustic musical event, actual or possible, may also be taken as the primary object of representation and encoding. MIDI is an example of a music representation language that seems focused on representing actual performances (Selfridge-Field 1997).

The current project undertakes to develop an XML-based encoding system that is comparable to MusicXML, MusiXML, MuseData, GUIDO, etc. in having as an objective the representation of musical content, and which deliberately and explicitly maintains a fidelity to particular scores, in a particular notation system (here, Chôngganbo). Once the intimacy and complexity of the connection between score and intention is admitted our encoding focus is nicely caught in Walter Hewlett's apt phrase: "the logical content of musical scores" (Hewlett 1997).

The theoretical issues are difficult and subtle, and it is not our intention to directly address them in this project, but rather to position our work to contribute to a larger discussion later.

## 3. TRADITIONAL KOREAN MUSIC NOTATIONS

Asian traditional music and notation are in many ways quite unlike western music and notation. There are many notation systems that have been used for Korean traditional music, however, today Osúnbo and Chôngganbo predominate. Osúnbo is Western CMN which was adopted after the Western modernization of Korea. Chôngganbo is a type of mensural notation developed by King Sejong in the 15<sup>th</sup> Century. It was the first mensural notation in East Asia (Park 2000). There have been several studies done on Chôngganbo and how best to interpret the notation, and some of these studies are in conflict with each other. For this paper, we will be adopting the most widely accepted perspective, that of Kim Kisu (Provine 2002).

### 3.1 Osúnbo vs. Chôngganbo

Since Osúnbo (CMN) is also widely used to write traditional Korean music, one might doubt the necessity of using Chôngganbo rather than Osúnbo — if Chôngganbo and Osúnbo are merely notational variants expressing the same musical intentions, then building a specific DTD for Chôngganbo, as opposed to Osúnbo (which could be more easily represented in existing XML music representation systems), wouldn't seem to be necessary.

Figures 1 and 2 present an example traditional Korean song in both its Chôngganbo and Osúnbo representations, respectively.

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As a first caution against adopting this approach we observe that, as described above, the invention of Chôngganbo has a deep cultural and political significance for Korea. But apart from the cultural meaning of Chôngganbo, we believe there may be distinctive theoretical and scientific reasons for making it the focus of representation, rather than Osûnbo, or ignoring notation altogether. At this point it seems quite possible to us that there are some things that can be represented in Chôngganbo, but not in Osûnbo. For example, at slow speeds, a Korean "beat" is a malleable event that can vary in length by up to about 300% (Provine 2002). This quality of flexible length is a presumed association with a box in Chôngganbo. A Western quarter note is not as flexible, and we generally assume, even in passages of *rubato*, that quarter notes roughly equal in length. Of course one can use Western quarter notes and explicitly qualify their durational characteristics — and when Koreans use Western notation, they in fact assume that elements of the notation, like quarter notes, share the characteristics of corresponding elements, like flexible durations, of Chôngganbo (Provine 2002).

Figure 1. Jung-yeongsan in Chôngganbo (Kim 1979)



Figure 2. Jung-yeongsan in Osûnbo (Kim 1979)

Another possible area of incommensurability is the relative efficiency of particular notation schemes. Due to the limited size of a Chônggan, Chôngganbo employs its symbols to simplify the representation of melodies. This space limitation has generated a notational scheme noteworthy for its being simultaneously succinct and yet semantically rich. Tone colour and note shaping (bending of pitches in certain pre-determined ways), for example, are two areas where Chôngganbo is especially efficient. Traditional Korean music prizes the "natural harmony of a note". The perceived effects between the "tensions" and "relaxations" of the string are another integral part of this music (Chon 1993). This is why the instrumental techniques of string performance are such an important part of both traditional Korean music in general and Chôngganbo in particular. It is important to note that when traditional Korean music is written in Osûnbo, extra symbols are needed to approximate these features that are otherwise intrinsic to Chôngganbo.

Finally traditional Korean music is not polyphonic (National Center 2002); it is rather, a part of the heterophonic tradition of performance that characterizes much of East Asian and Middle-Eastern music. In heterophonic musics, melodic richness is enhanced not through harmonic accompaniment, but through the simultaneous performance of the principal melody by the performing instruments with each instrument having a relatively independent flexibility with regard to ornamentation, rhythmic deviations and tone colour. Again, when traditional Korean music is notated in Osûnbo, only one set of the many possible manifestations of the heterophonic performance is "fixed", implying a rigidity of interpretation not otherwise inherent in the intention of the composer.

The preceding observations lead us to our working hypothesis that "representing traditional Korean music in Western notation imposes presumptions of style and sound that are only appropriate to Western music" (Provine 2002).

4. FUTURE RESEARCH

Traditional Asian music, and traditional notation like Korean Chôngganbo, are quite different from their Western counterparts, and the preceding preliminary analysis suggests that until definitely shown otherwise we cannot assume that traditional Korean music can be adequately represented by XML-encoding systems designed for Western music and Western notation. We will continue to extend and verify our analysis to determine whether the representational framework we are constructing matches the distinctive expressive features of Chôngganbo, particularly with respect to such things as granularity, syntactic constraints, hierarchical structures, determinacy, overloading, and cognitive processing. Eventually we intend to harmonize our perfected analysis with ongoing work in CMN XML representation projects, either through extension of existing systems, or, if that is not possible, through the development of an overarching framework that coordinates the disparate specialized music XML systems.

5. ACKNOWLEDGEMENT

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