# A MELODY COMPOSER CONSIDERING GENRES FOR BOTH TONAL AND NON-TONAL LANGUAGES BY FREQUENT PATTERNS MINING WITH BUSINESS PROPOSAL

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## ABSTRACT

Music is a temporal art, which unfolds over time. Unlike painting, which is a spatial art, can be seen entirely immediately. Because of its temporal nature, music can tell more things than other arts do. Composer can express his feeling and tell his story through music.
Song is a kind of music that contains lyrics. Song can express more things than a plain music does. People want to have their own songs for some special events such as graduation ceremony and wedding. Composing a plain music is hard. Composing a song is even harder because of the presence of the lyrics. People may seek help from computer to compose their own songs. The study of using computer to compose music is called *Algorithmic composition*. There is a algorithmic melody composer called "T-Music", which mines the correlations between the melody and the lyrics in existed songs and uses these correlations to generate a melody for the user-input lyrics.

This thesis studies the ways to enhance T-Music. The correlations are represented in

*frequent patterns* (fps). We have defined a new way of how a pattern is considered to be *frequent*. By using the new definition, the fps can represent the correlations more realistic. The original mining algorithm can only mine the correlations from songs. The lyrics must be presence. Two new algorithms are proposed to mine information from plain music. These information can improve the quality of the generated melody.

In other to use the fps mined from songs with lyrics in the language $L_1$ to compose a melody with the lyrics in another language $L_2$, a tone mapping is required from $L_2$ to $L_1$. An optimal mapping algorithm has been proposed so that T-Music can use the fps in $L_1$ the best to compose a melody for the user-input lyrics in $L_2$.

In other to impose music genres on the generated melody, the characteristic of different music genres have been studied and are included in T-Music. T-Music can generate a melody for the user-input lyrics in some particular music genres such as traditional Chinese music and dance music.

A business plan based on T-Music has been included so that the uniqueness and values of T-Music can be well presented.

In addition, a comprehensive introduction of the background knowledge of music and language are included so that readers with different backgrounds can understand this thesis well.