Analysis of Vocal Ornamentation in Iranian Classical Music

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ABSTRACT

In this paper we study tahrir, a melismatic vocal ornamentation which is an essential characteristic of Persian classical music and can be compared to yodeling. It is considered the most important technique through which the vocalist can display his/her prowess. In Persian, nightingale’s song is used as a metaphor for tahrir and sometimes for a specific type of tahrir. Here we examine tahrir through a case study. We have chosen two prominent singers of Persian classical music one contemporary and one from the twentieth century. In our analysis we have appropriated both audio recordings and transcriptions by one of the most prominent ethnomusicologists, Masudiyeh, who has worked on Music of Iran [1]. This paper is the first step towards computational modeling and recognition of different types of tahrirs. Here we have studied two types of tahrirs, mainly nashib and farâz, and their combination through three different performance samples by two prominent vocalists. More than twenty types of tahrirs have been identified by Iranian musicians and music theorists. We are currently working on developing a method to computationally identify these models.

1. INTRODUCTION

The repertoire/system of Persian classical music, radif consists of seven dastgâhs and five āvâzes (secondary dastgâhs). Each dastgâh consists of several pieces (gushes). These gushes are in different maqâms and they are related to each other through a special order, which provides a path for modulation from one maqâm to another inside a given dastgâh [2]. Radif is a model and source for improvisation. The pieces in vocal and instrumental radifs are rarely performed exactly as they appear in radifs. The musicians use the models and patterns in radif to improvise new pieces. During the twentieth century, the radif was established as an icon of tradition, authenticity, and heritage. It has been the center of discourses about preservation, change, creativity, imitation, individuality, emotion, style, meaning, authority, and national roots in Iranian music. Through these discourses, the radif has been developed as a two-headed arrow pointing towards the future and creativity, and at the same time towards the past and authenticity.

There are two main recorded vocal radifs sung by two masters of the art during the twentieth century: Davâmi and Karimi.

Tahrir is rapid transition between the main note and a higher-pitched note. The second note is usually referred to as tekhyeh, which means leaning in Persian. From signal processing perspective one of the differences between tahrir and vibrato is that the pitch rises and fall in tahrir is usually sharper and the deviation from the main notes can be larger compared to vibrato [3]. Also, the oscillation in vibrato is toward both higher and lower frequency around the main note, but in tahrir mainly the higher frequency is touched abruptly. There are different types of tahrir in Persian vocal music that can be categorized from both performance style perspective and from studying the melodic contour.

We have decided to study the transcriptions of radif as well as the audio, since these transcriptions are among the main sources for teaching and learning radif. Musical notation has a long history in Iran. We can see early examples of musical notation in Maraghi’s works in 14th century [4]. He uses alphabet letters to show the pitch and rhythmic circles to illustrate the rhythm of the pieces. When western musical notation was introduced in Iran, it naturally replaced the use of alphabets and rhythmic circles [5]. Nowadays it is part of the musical pedagogy in modern Iran. Furthermore, transcriptions of vocal radifs are among important sources for instrumentalists who usually accompany the vocalists in a form of āvâz and javâb āvâz (question and answer). In this form the vocalist sings a hemistich of poetry and the instrumentalist plays a short sentence as a reply to that. The musical intervals we see in the transcriptions in this paper, although in some cases are different than what the vocalists sings, are the intervals that instrumentalists use in their answer to the voice.

In order to understand different types and styles of tahrir we need to parametrize the characteristics of tahrir. Since there has not been enough computational models for analyzing tahrir, the parameters of vibrato can be a good start for modeling different types of vocal embellishments. Luwei mentions four computational attributes for vibrato: rate, extent, sinusoidal similarity, and envelope. Vibrato rate determines the tempo of the vibrato, the extent shows the variation in the fundamental frequency of the pitch in vibrato, sinusoidal similarity examined the similarities between the shapes of vibratos, and envelope which shows the changes in the vibrato extent [6].

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2. VOCAL TRADITIONAL MUSIC IN IRAN: A BACKGROUND

2.1 A brief history of musicological research and music education in modern Iran

Interest in education and research on Persian music increased during the twentieth century. Among the most prominent musicians from the early twentieth century to the 1970s, one can mention Vaziri and Khâleqi, who were both modernist and in favor of using Western music methods and ideas to “improve” Persian classical music. The efforts of such modernist musicians changed the status of music in the society. The classical Iranian music became recognized as an element of “high culture” associated with the newly formed urban middle class. Western ethnomusicologists started to visit Iran for fieldwork and ethnographic research. The main areas of their focus were Persian classical music and folk music. Among the prominent Western ethnomusicologists who worked on Persian classical and folk music, one can mention Nettl [7] and Blum [8] and [9], who did their fieldwork in Tehran and Mashhad in the 1960s, Zonis who visited Tehran during the years 1963-1965 [10] and [11], and During who visited Iran multiple times since the mid-1960s. They all worked closely with very prominent musicians of the time in Tehran and other large cities. The first works on Persian classical music were mainly devoted to different aspects of the radif [12], [7], and [13], as well as biographies of musicians [14] and [15], documentation, transcription, and archiving [1].

The process of documentation and transcription of the radif, together with the availability of recording technology, partially, implicitly, and gradually changed the music scene of Iran. The idea of protection and preservation started to work, to some extent, against itself, even before scholars could notice the flaws and the contradictions of this idea. Descriptive transcriptions of the radif by various Iranian and Western ethnomusicologists and music scholars, and the recordings of masters, later served as sources of knowledge. The practice of radif has changed partially from an oral tradition to a written tradition. The role of memorization of the whole radif has been reduced to a great extent. Students learn “improvisation” more as a technique, and perhaps to some extent mechanical, rather than as a result of full and in-depth knowledge of radif. Many students use recordings of different masters and transcriptions of radif to familiarize themselves with various performing styles. The direct master to student teaching, which was historically central to the practice of the radif, became inevitably less important in the new setting. This “modern” setting brings up many questions regarding the forms of continuity and discontinuity in the functions and directions of traditional music in today’s Iran.

2.2 Traditional Music after the 1979 revolution

Historical events 1, after the 1979 revolution and the anti-Westernization movement changed the cultural scene of Iran. The restrictive cultural policies of the government almost eliminated production of popular music. The government defined the “appropriate” (mojâz, acceptable) forms of music, whose definition always remained vague and changing. The lyrics have been among the important elements for deciding the “appropriateness” of music. Persian classical music, traditionally, has been linked to masterpieces of Persian poetry, such as ghazals 2 of Hafez, Sa’dî, and Molavi (Rumi). This is an important factor that gives traditional music a relatively safe position. Another factor in deciding on the “appropriateness” of the music is the performers. The government accepts older male musicians more easily compared with their young and/or female counterparts. In general, there are always exceptions to these rules. Because of the nature of traditional music, it has always been one of very few genres that is judged as “appropriate.” In the absence of popular music, famous traditional musicians, such as Shajariân, Lotfi, and Alizâdeh gained the social popularity of pop stars. This made the prominent traditional musicians less accessible for teaching. Many of these musicians no longer accept beginning students. Many of them teach workshops that accept a limited number of performers from many applicants. These social factors contributed to fundamental changes in the classical music.

After the 1979 revolution, international policies made Iran a difficult destination for Western visitors, including ethnomusicologists. Furthermore, because of governmental censorship, the safest areas of studies for insider scholars were those that did not involve any social and political issues. Hence (purely) musicological study of “appropriate forms of music” has been one of the most popular topics for Iranian ethnomusicologists after the revolution. Among the more recent works in this field one can mention Bubân’s dissertation which compares the rhythmic patterns of the Persian language with rhythmic patterns of the radif [5]. She also talks about the insufficiency of Western musical notation for rhythm in Persian music and suggests a visual notation. There are many other recent works on the radif, among which one can mention Asadi’s dissertation, which is on the structure of the radif [16], Azâdehfar’s book on rhythm in Persian âvâz [17], Mehrâni’s three-volume work on the theory of Iranian music [18], Fereydu’s book on the characteristics of the vocal radif of Davâmi [19], and Jafarzâdeh’s book on Iranian musicology [20].

2.3 Vocal Traditional Music

The word âvâz has several meanings in Persian. It refers to humans’ singing as well as the sound of birds and instruments in old Persian literature. In Iranian traditional music, âvâz specifically means the elaborate improvisatory non-metric part of the vocal performance usually accompanied by one instrument at a time in the form of âvâz and javab-e .

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1 Among the important events one can mention the Iran-Iraq war (1980-1986), and the Cultural Revolution (1980-1983).
2 A classic form of Persian poetry
ävâz, also known as question and answer, which is considered a dialogue between the vocalist and the instrumentalist. In this part the vocalist leads the performance and sings some or all lines of a ghazal, and the instrumentalist answers creatively. The vocalist usually sings one or two verse(s) in each selected gusheh of a dastgâh.

The most common format of the performance is to start with vocables and then to sing the first line of verse in darâmâd which is the beginning gusheh of each dastgâh and then sing other lines of verse in a different gushehs of the same dastgâh in a conventional order. Usually there is at least one main modulation, which gives a feeling of a different maqâm and then finally last line of verse is sung in forîd, which is a return to the main maqâm. The duration of ävâz depends on the proficiency of the singer. One of the main elements of ävâz, which shows proficiency in singing traditional Iranian music is tahrir. The expertise and the level of proficiency of a singer is evaluated mainly in this part of the performance (ävâz). There are singers who can only sing tasnîfs (a metric pre-composed piece). Tahrir usually appears towards the end of hemisticch, or on the words where vocalist want to emphasis on the meaning.

3. TAHRIR: A CASE STUDY

3.1 Different types of tahrir

Mohammad Reza Lotfi, one of the most prominent Iranian musicians and târs players of the late twentieth century identifies seven types of tahrir based on Davami’s performance of radif [19]. We studied three references in Persian that classify different types of tahrir [19] and [18]. Nashib and farâz are two types of tahrir according to these sources.

3.2 Karimi’s Vocal Radif

Karimi is one of the main masters of the art in the twentieth century. His repertoire consists of 145 gushes. His performance is recorded and available to public. It has also been transcribed by one of the most prominent ethnomusicologists, Masudiye [1]. It is later transcribed by two other musicians, Atrayı and Tahmâbsî. Hence for each gushe of Karimi’s vocal radif, we could have three MIDI files that are slightly different. Finally, after much consideration we found Masudiye’s notation more appropriate for the purpose of our study. Figure 1 shows the way we organize our study.

As can be seen in Figure 1, we have used PYIN for pitch recognition, using Sonic Visualiser, Smoothed Pitch Track transform by Mathias Mauch and Simon Dixon [21]. Parallel to the audio we have made a table corresponding to the MIDI file, and then we have used Dynamic Time Warping [22] algorithm in MATLAB to compare these two curves. We modified the MATLAB dtw plot function, so that we can mark the differences between the two curves. The results can be seen in Figures 2 and 4.

3.3 Tahrir-e Nashib and Farâz in vocal radif of Karimi

Tahrir-e nashib (literally: descend), and farâz (literally: ascend) are two types of tahrir that is discussed by Ferayduni, Mehrani, and Lotfi. Their melodic movement as it can be inferred from their names is a slow descend or ascend towards the main note, where the vocalist or instrumentalist usually spends a relatively longer time. The movement is most of the time towards the shâhêd or ist, or owj, which are the main functional notes in each gusheh. According to Owen Wright “Shâhêd (‘witness’) is the most prominent pitch of the gusheh, its salience marked primarily by relative duration; ist (‘stand’) is an intermediate phrase final note other than the shâhêd.” [19] p. 33. Owj (‘peak’) is usually a fifth above the shâhêd of a gusheh.

Figure 2 shows tahrir-e nashib in the final phrase (forûd) of the gusheye darâmâd of shur in Karimi’s radif. The vertical axis shows the pitch value in cents and the horizontal axis is time. As we can see in this figure there is a mis-match between the audio and transcription. We have marked the duration mismatches in Midi with yellow. The red color shows the audio and blue shows the midi. Figure 3 shows the original Masudiye’s transcription of the same tahrir. The circles below the notes show leaning (tekyeh) of the main note towards the higher note.

Figure 2. Tahrir-e nashib in darâmâd of Shur of Karimi

Figure 3. Tahrir-e nashib in darâmâd of Shur of Karimi, Masudiye’s transcription, page 13, line 4 of darâmâd

One of the melodic characteristics of tahrir, as can be seen in the above figure, is a repetition of a simpler form
or group of notes. In the above *tahrir* the repeating form consists of a note which leans toward a higher pitch. In this example the interval between the main note and the peak of the higher note is at most as high as about a tone and half (≈300 cents). The vocalist repeats the same pattern in a descending manner. Sometimes different types of *tahrir* can be combined to form a more complicated melodic phrase. For example in *daramād of bayāt tork* we have a longer pattern which consists of a *nashib tahrir* followed by *tahrir-e farāz*. As can be seen in Figure 4, the whole longer pattern is repeated twice. In figure 5 we see Masudiye’s transcription of this *tahrir*.

![Figure 4. Tahrir-e nashib followed by tahrir-e farāz in daramād of Bayāt-tork](image)

![Figure 5. Tahrir-e nashib in daramād of Bayāt-tork of Karimi, Masudiye’s transcription, page 49, lines 3 and 4 of daramād](image)

### 3.4 Tahrir-e Nashib and Farāz in Shajarian’s Performance

Figure 6 shows a sample of Shajarian’s *tahrir* in *gushe-ye Owj* in the hemistich (36’01”- 36’14’): “baske shostim be khanābe jegar jāmeye jān.” This *tahrir* is on the last word, jān, and on vowel ā for 5 seconds, involving the sequence G, F, F, E, E, D, E, E, F, F, G with tekyehs to higher pitches. Fereyduni mentions the name “*nashib o faraaz*” for this type of *tahrir* ([19], P. 19). This name is also mentioned by Payvar, in his transcription of Davami’s *radif*. In this *tahrir*, the average duration to reach the peak of the tekyeh note from the main notes is 0.75 m.s. The highest frequency jumps in this *tahrir* are about one and half tone (≈290 cents), and the lowest frequency jumps are about a half tone (≈90 cents).

### 4. FUTURE DIRECTION

Our goal is to computationally analyze more *tahrir* types and their subtle differences. We would like to study *tahrirs* performed by various vocalists and to find their stylistic features.

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4 Hannavā bā Bam [“Compassion for Bam”]. Delāwārz. (Tehran concert and background documentary). 2006, available at: https://www.youtube.com/watch?v=7xaZQOPW88

5. REFERENCES


