Modulating the Logics of Iranian Classical Music

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Abstract

The objective of this dissertation is to explore Iranian classical music as a historical situation in context of its theories and concepts in order to find a way for composing a piece of music which is, although, exclusively constructed by the fundamental elements of Iranian classical music, the piece is a truly contemporary piece of music. By exploring Iranian classical music, I tried to give an overall view of the situation of Iranian music, and specify a list of theoretical and conceptual fundamental elements of Iranian classical music. For specifying the theoretical elements I mainly used the old Iranian music treatises and modern analysis of Iranian classical music. And Sufist attitudes, as one of the important part of Iranian culture, was my main source for finding the conceptual elements of Iranian music. Two different compositional approaches will be explained as the practical ways that I tried in order to compose two pieces. In the first one I tried to make an artificial Iranian improvisor, and in the second one I tried to use the conceptual and theoretical elements of Iranian classical music in order to construct an absurd musical construction.

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Contents

Chapter one

Introduction

The main objective of this project is to explore different elements of the situation of Iranian music like old modal theories, Radif, Sufism, conceptual structure and etc., in order to get closer to the point of creation of such an idea which could be a new subject in the situation of Iranian music.This point may not tolerate any indication. Nevertheless, it maybe possible to guess its environs. A guess by chance. There are only two things which increase the chance of occurrence of a desired action: firstly, studying the situation and secondly, which is more important, is trial and error.

One the important elements of this project is fragmented identity. Of course nowadays, identities apart from considering the culture and place that they belong to, turn to be super fragmented. In case of non-Western countries, the idea of super fragmented identity seems more critical. For example, nowadays, an Iranian grapples with Western culture through mass productions, media, food, football, fashion, advertisements, and so forth. On the other hand, the same person deals with the propagandas which have been tainted by the Iranian-Islamic tendency of the government, which bear anti-Western sentiments. Apart from these, his/her identity gets affected by matters such as patriarchy, patriotism, Sufism and Iranian art during his/her routine life. These different cultural packages do not enter into a dialogue with each other. On the contrary, In fact, these cultures are involved in a battle

against each other. In this battle, the cultural apparatuses play the roles of the warriors and the bodies of people have been targeted as the battlefield. At this stage we deal with an important question: “What is the result of this battle?” To me, the result is an enormous perplexity. Which means, when the identity carrier deals with the techniques and specialities, he/she is capable to learn and even reproduce them. However, since there everything seems ambiguous and dark to him/her, the difficulties appear when he/she strives to enter into the world of concepts. Consequently, It would be very hard to create a new and autonomous piece which has been derived from his/her real situation.

At this stage, I would like to present a very significant question: “Is it possible to create a new subject in Iranian music situation?” For answering this question, it would be necessary to first of all define a subject. To Alain Badiou, subject is a new element in a situation where the language and knowledge of the situation could not explain it. A subject is created by an incalculable and unpredictable event which exists beyond the status quo and transforms the whole situation (Badiou, 2004). Therefore, it would be impossible to answer the question by analyzing subject. Because, if it was possible to analyze a subject before its occurrence, it would have not been a subject anymore based on its definition. However, it would be possible to check, if the situation of Iranian music has the potential of having a subject in itself or not. Badiou defines two types of situation: natural and historical. A natural situation essentially cannot have a subject in itself. It preserves its current situation unless an alien factor brings a change into it. In contrast, a historical situation has been characterized by the presence of at least one abnormal element which is a subject (Hallward, 2003). It is quite clear that Iranian music is a historical situation owing to the fact that music is all about creativity and innovation. Although, existence of such a potentiality is not a definite reason

for occurrence of event, at least it is possible to be assured of its possibility.

As a conclusion, I would say this project does not emphasize on the ethnomusicological aspects of Iranian music, rather it tries to be a curious compositional point of view of a composer to himself and his predecessors, in order to compose compositions which are resulted from his true contemporary situation.

This thesis consists of this introduction, a conclusion and three other chapters. First chapter tries to first of all explain the reasons of necessity of this research project by giving a historical overview, depicting the present situation and bringing up the crucial points and then it tries to clarify the aims of this project by proposing a suggestion. Second chapter mainly talks about different aspects of Iranian classical music in past and present. And finaly the third chapter explains my different approaches in first and second year of my master program.

Most of the references, specially for the subjects that I have used in the second year of my master program, are Persian. Since one the main objectives of this project is to modulate the logics of Iranian music by the logics of Iranian music, I deliberately limited myself in the realm of Iranian classical music, culture and concepts and consequently references. All Persian sources have been translated by the author.

Chapter two

First Contact or Attack

2.1 First Contact

Around the middle of 18th century, Naseredin Shah (1831-1896), the king of Iran at that time, visited Paris. At his welcoming ceremony, the military orchestra of France performed their national anthem. He was strongly impressed by the glorious and harmony of the music. On his return to Iran in 1867 the King asked his ambassador in France, to hire a French musician to reorganize his military orchestras and make an Iranian national anthem along Western European lines. Adolphe Niel, France's Defense Minister, selected Alfred Jean Baptiste Lemaire (1842 – 1907), known as Monsieur Lemaire in Iran, to take up the post. Lemaire funded a military music department in an Iranian school, Dar Ul-Funon, in 1868 (Khaleghi, 2002). He, or probably one of his Iranian students, composed the first national anthem of Iran. Naseredin Shah could not hear this national anthem, since he got killed before its preparation, but military orchestra of France played it at the welcoming ceremony for his son Mozafaredin Shah at 1897. Apparently, it was the first contact between Iranian and Western music. Lemaire taught Western notation, harmony and generally theory of Western music to his students. Some of his students went to europe to follow their education in Western music. And at their return, they made a new music stream in Iran under the title of Western music. This style, by different shapes, has been continued to its existence till now.

2.2 Situation of Iranian Music After the First Contact

In a general view, today, we can categorize the main Iranian music streams into three categories:

Iranian Classical music: Nowadays, Iranian classical musicians struggle to save the Iranian traditions. They condemn Western music to care too much about materialist and physical matters, and also human`s superficial sentiments.

> These kinds of [Western Post-Renaissance] music [...] to a large extent contribute to the sense of "freedom" from order, although this freedom is often nothing other than the freedom of the lower impulses of the soul and the psyche from any higher principle rather than freedom in its spiritual and religious sense. (Nasr, 2003, p. 224)

On the other hand, they believe Iranian music has a very natural being, which tries to reach the deepest layer of human`s spiritual being. They also blame Western polyphonic music for being very simple. They believe the complexity have a direct relation with details, but Western polyphonic music kills all the details and subtleties, in both, time and melodic structure in sake of harmony. They claim in Iranian monophonic music details are very important, because all the tones are chosen based on their specific and unique characteristic, and not based on a deterministic procedure of being a degree in a chord. And also an alive music, I mean a music which has a soul, is only possible in improvisational music traditions such as Iranian and Indian music. Because for making an alive music, the composer should tie the procedure of creation and presentation to each others. All in all, they believe Iranian classical music is the purest and the must natural kind of music.

Western Music: Iranian Western musicians criticize Iranian music to be a primitive style of music. And on the contrary, they consider Western polyphonic music as the most progressed music in the world. They say Western music used to have the same monophonic,

improvisational and modal nature like Iranian classical music. But Western musicians developed their music and discovered the rules of harmony. Roholah Khaleghi (1906-1965) an Iranian composer in his book *Theory of Persian music* said:

> Unfortunately, this [matter of simplicity of Iranian music] is true. When we listen to the European music, we can see that all instruments have an specific role, and their harmony make a specific feeling which is not possible to find it in Iranian music. This is the reason for reluctancy of the people who are accustomed to Western music, to listen to Iranian music. [...] The lack of harmony in our music resulted in a limited, simple and emotionless music. (Khaleghi, 2003, p. 378)

They also claim, Iranian classical musicians try to hide their weaknesses under a cover of spirituality. Thus, they try to follow Western music, like a Western composer, in its original way and consider it as an international kind of music.

Third way: Obviously, this group is looking for a way to connect these two categories to each other. Some of them try to artificially pass Iranian music through the way which Western music has passed. They try to, for example, temper the intervals in Iranian modes, and making a theory for Iranian harmony and orchestration (Farhat, 1990). Some other use Iranian music like a ready made in their pieces. Whatever else they do, generally they try to import Western musical culture to Iran, not directly the music itself. Therefore, consciously or unconsciously, they also believe in superiority of Western music.

2.3 First Attack

I do not want to evaluate the entrance of Western music to Iran as a positive or negative phenomenon. Otherwise, I want to emphasize on the undeniable impact of this matter. Eventually, Lemaire and his students made a very deep gap in the situation of Iranian

music, which has completely changed Iranian music. This gap prevents the followers of first and second categories from their main goal, which is purity; pure Iranian classical music and becoming a pure Western musician. Because in fact, today, even Iranian classical musicians, which has been trying to resist against Western music, have accepted lots of alien components. For example playing music in concerts, using a standard tuning system, modern forms of presentation such as recording and publishing audio tracks in CDs or on the internet, are just some of the very common things that most of the Iranian classical musicians do, and all of them are strongly Western and also very contradictory to their spiritual idea of pure music. On the other hand, the desire of Iranian Western musicians for metamorphosis of their identity is also simplistic. Because, their minds are full of Iranian melodies and musics, and they should call all of them exotic, but indeed they are more familiar than Western ones.They can not erase their musical memory, they can not forget all melodies were whispered in their ears from their childhood.

It is not easy to talk about the third way, since it has lots of different shapes and has tried verity of approaches. But I think their main problem is their perception of the collision of Iranian and Western music. They think Iranian and Western music are two different things that had never met each other before Lemaire entrance, and Lemaire introduced them to each other. And now they should make a conversation with each other and talk about themselves, and this dialogue would result in a new and probably more complex and powerful phenomenon. I think this peaceful understanding of their collision is completely wrong. In fact, the first Iranian national anthem was not the first contact of Iranian and Western music. Iranian music has been in touch with Western music in many other occasions through the whole of its history (Coomaraswamy, 2012)[1]. For instant, Abu Nasr Farabi(872 – 950), talks about Pythagorean beliefs on music in the first chapter of his treatise on music, Moosighi Al-

1 Coomaraswamy talks about Asian and Pre-Renaissance Western Art, not specifically Iranian music.

Kabir (Barkeshli, 2010). They even knew about harmony, obviously they did not talk about Wagner`s chromatic harmony, but even talking about simple harmony rules in 10th century is quite interesting.

Thus, if Iranian music has been in touch with Western music before Lemaire, “Why Lemaire, who was a normal military musician and probably was not good enough to convince French generals to keep him in France, had such a strong and deep impact on Iranian music?” I think the answer is, ironically, related to his uniform. In fact, Lemaire did not make the first contact between Iranian and Western music. On the contrary, he changed the role of Western music as probably a friend, or at least a weird fellow, who used to make conversation with Iranian music, to an invader, who does not want to talk. It just wants to completely change everything. The only way to talk to it, is to first of all obey all of its rules and beliefs, but what is music except rules and beliefs. So, I want to say the different quality of this collision with the former ones is very political. But whatever it is, it is any thing but peaceful. I believe for making a new truthful thing in a situation, first of all, one should have a truthful and impartial perception of the situation. Although, some of these approaches have a more or less correct perception of some parts of the situation of Iranian music, they are not impartial. And some others which try to be impartial, have a wrong perception of the situation. And this is exactly the crucial point.

2.4 A Suggestion

I want to propose a suggestion, which is the main core of this research. We, I mean Iranians, middle eastern, non-Western people or anybody else who has the same feeling about his/her situation, should not try to understand Iranian_or any other kind of non-Western _ music in context of Western music, or Western music in context of Iranian music, or better to

say, we should not look for a way to see how Iranian music could survive in a Western womb. On the contrary, we should try to understand the Iranian music in the situation of Iran and Iranian contemporary society and culture. Of course, today, Iranian culture is extremely fragmented, and Western culture by its media, fashion, food, football and other attractive productions, strongly lives in many aspects of Iranian culture. But the fundamental question, that we should try to find its answer/s, is not to follow them as they are in their original shape in Western countries. Their original shape is very important. But it is just the beginning. Thus, I do believe the question is, "How do they exist and live in Iranian culture and society?" As same as the different function and meaning of Persian carpet in Western countries, Western products also have different cultural qualities in Iranian culture. So I think, instead of looking outside, we should deeply look and explore ourselves, in order to find the fundamental and constitutional components of Iranian identity, and then bring them to the present time and try to interpret them in our contemporary life.

To conclude this issue, I want to give a concrete example about harmony and Iranian music, which seems to be one of the main issues for Iranian musicians in the third category. I think the question that we should try to answer is not, "How is it possible to compose a polyphonic Iranian piece?", or "How is it possible to harmonize Iranian quarter tones?", or even "How to make a serial by an Iranian chromatic scale with 18 degrees?" Rather the question is, "Although Iranian musicians knew about harmony for centuries, why it was not interesting for them?" And if the answer was found, we should bring it to our present lifestyle, and try to understand how and in what shape it exists in our mind at the present time. This is the reason for the title of my research, *Modulating the Logics of Iranian Classical Music.* I mean in the same way that the amplitude or frequency modulation of an oscillator by another oscillator results in a new sound which is very different from two sine

tones, I want to modulate the logics and concepts of Iranian music by themselves. Although, the result may look very different from Iranian classical music, it is not anything but the logics and concepts of Iranian music.

Chapter Three

Iranian Classical Music: Theory, Concepts and Roots

Iran as one the oldest countries in the world has a long, reach and deep musical culture and history. There are evidences that show us even around 6000 years ago (Maref, 2004), Iranians had music instruments and probably ritual music. But as much long as the history of Iran is, Iranians have passed numerous incidents and disasters. Therefore, the history of Iranian music is very patchy. Today, Iranian classical music called *Dastgahi*, I will talk about it in next part of this chapter, but before that Iranian music used to be a modal music for centuries. As I said it is not possible to follow the Iranian modal music tradition through the whole history. But one of the most influential groups that, undoubtedly, Iranian classical music is strongly rooted to their style and theories, is *Montazamieh*. Thus, in this chapter first of all I will talk about Iranian modal music, and then I will talk about *Radif* and Dastgahi music, and then I will continue by roots and concepts of Iranian music. It worth to say that, the goal of this chapter is not to give a comprehensive explanation about Iranian classical music and all of its aspects, rather it tries to talk about the materials which are interesting for me and I have used them in my pieces.

3.1 Appearance of Montazamieh School[1]

The discovery of quarter tones in eighth century by *Zalzal*, resulted in a huge

1 Doctrine

differentiation between middle eastern music and Western music. Zalzal by these tones made new modes, and by these new modes he offered a large variety of new melodic structures to the musicians (Maref, 2004). This could be one the reason that Iranian music mostly progressed in a modal way. His innovative idea were quickly accepted by musicians all around Islam world. After him, his colleagues and students developed his ideas and wrote lots of treatises and theoretical books which are resulted in a modal compositional system with 12 modes. But after a while the gesture of discovering new tones became very popular among musicians. Almost all musicians were trying to make new modes and tones. This procedure caused a large chaos in middle eastern music. For instance, on the finger board of the instruments, there were lots of confusing frets, and also it was not possible to define and compile a precise and comprehensive theory for the music of that time. For centuries lots of famous musicians, who were the most prominent scientists and scholars of their time, had been trying many ways to organize this chaos and even some of them tried to eliminate the new intervals. However, none of them succeed. The problem remained unsolved till the appearance of Montazamieh school of music and its funder Safi Ad-Din Ormavai (1216 – 1294) in 13th century.

Undoubtedly, Ormavi divided Iranian music history in two parts, before and after him. He had such a great influence on Iranian music that we can say all the musicians after him just going through the way that he paved. He found out all of these new tones are actually fake and there is not any new tone except the Zalzal`s quarter tones. Therefore, for playing these new modes it does not need to use new tones and frets, rather players should just use different positions on the instruments (Maref, 2004). He also defined very precise and comprehensive theory for Iranian music based on his 18 tones scale. And after him, his students and followers developed his style and created couple of valuable treatises on music.

Safi Ad-Din and his students made a musical style or school, which its name is Montazamieh.

3.2 Montazamieh and the Theory of Adwar[2]

Adwar by Safi Ad- Din Ormavi and *Jame al-alhan* by one of his followers Abdol Qader Maraghi (middle of 14th – 1435) are two treatises on music which are the main sources for either Montazamieh theory of music and Iranian modal music. Both treatises, more or less, follow a same structure. But since the first one belongs to 13th century and the other belongs to 15th century, the later is more comprehensive. Jame el-Alhan is like a commentary on the former. Therefore I am not going to talk about them separately, rather I want to give an overall view of both.

These books first of all trying to give a definition for music:

> Music is a set of different and specific tones which are composed in a specific and correct arrangement. (Maraghi, 2009, p. 10)

Then they explain two different groups of phenomena, understandable and perceivable. Although, I am sure there are better words and translation in English, I could not find them. Thus I am trying to explain them. Understandable phenomena are like mathematic, means if you know the digits and meaning of plus (+), you can understand what is the meaning of 1+1 and you do not need to see for example one apple plus one apple. But music belongs to the perceivable phenomena, which means, even if you know what sound is but you have never listened to music, even if somebody, for infinity, talks about music for you, you can not understand what is music, because you should perceive music.

> Thus, the substance of music is hidden for us, and consequently there is not any complete definition for music except music itself. So, since a definition of music

2 Adwar in Persian means cycles

could not be complete, it should just be correct. (Maref, 2004)

Next question that they tried to answer is, “What is the subject of science of music?” and the answer is: “Science of music should talk about tones in respect of the validity of their composition.” (Maraghi, 2009, p. 11)

Then they define tone:

> All tones are sound, but all sounds are not tone. Sound is a specific [range of] frequency[s][3] which is produced in air. But tone is a sound which should be studied in terms of its relationship to other tones. (Maref, 2004, p. 151)

Next chapter is about tones within an octave. In Safi Ad-Din chromatic scale unlike, Western music which has 11 equal, tempered, intervals there are 17 unequal intervals. Table 3.1 shows this chromatic scale. Left column shows the Western equivalent notes, and their names as Montazamieh`s musicians mentioned are in the right column. In the middle one I tried to show, how they abbreviate the notes in their scores. They used *Abjad* alphabet system, which is Arabic alphabet in a specific order, something like the order of alphabet in English, e.g. A B C D etc. So I used the English alphabet to show how they treated the notes, and the interesting point that I want to emphasis is, they did not use a same alphabet for chromatic semi- tone intervals, rather they used a different letter for each degree on their chromatic scale. The last points that I should explain are Koron and Sori which mean a quarter tone lower or sharper than the normal tone.

After this introduction they explain how to find these tones on an instrument, and there are large amount of calculations to show how to adjust the frets on a fingerboard.

The next chapter begins by the definition of interval: “The relationship between two different tones which are played successively or simultaneously is an interval.” (Maraghi,

3 The word that is used for frequency in the treatises is *Tawator,* which means something like fluctuation or frequency.

2009, p. 19) It categorizes intervals in two categories, obviously: dissonant and consonant. And it also explains an interval could be consonant for successive tones and dissonant for simultaneous tones. (Maraghi, 2009)

there are three kinds of consonant interval:

1. Ala: It is the most consonant interval. It is possible to use these tones instead of each other. This interval is consonant in both melodic and harmonic way. It is, actually, an octave.

Western Equivalent	Abbreviation	Original Name
C	A	Motlaq
C sharp	B	Zayed e Motlaq
D koron	C	Mojanab Sababe
D	D	Sababe
E flat	E	Vostay e Fors
E koron	F	Vostay e Zalzal
E	G	Benser
F	H	Khenser
F sori	I	Zayed e khenser
F sharp	J	Mojanab e Zolkhams
G	K	Zolkhams
G sharp	L	Zayed e Zolkhams
A koron	M	Mojanab e Zolsadas
A	N	Zolsadas
B flat	O	Zayed e Zolsadas
B koron	P	Mojanab e Zolsaba
B	Q	Zolsaba
C	R	Zolkol

Table 3.1 Safi Ad-Din chromatic scale (Maref, 2004, p. 167)

2. Wosta: This interval is consonant in both melodic and harmonic way, but it is not possible to use the tones instead of each other. There are two kinds of Wosta which

are actually perfect fifth and fourth.

3. Adna: This interval is consonant for melody, but dissonant for harmony. There are three kinds of Adna which are tone, semi tone and quarter tone. (Maraghi, 2009, p. 48-49)

Intervals could be larger than an octave. The first and second categories are consonant even in other octaves. So there are nine consonant intervals in two octaves.

In the next chapter they talk about forbidden actions in Iranian music. I think one of the most important features of Montazamieh is their approach to the correct and the wrong. As I observed and understood, they believe music does not happen by juxtaposition of correct things, rather it happens by exhausting the material of its possibilities and then wiping the forbidden elements out.

Before an explanation about the four forbidden elements, I should explain a concept in Persian music, *Dor*:

Dor means cycle and nowadays in Iran we call it *Maqam* or *Mayeh*. Although some times it has different qualities, in English we can call it mode. The name of Safi Ad-din`s treatise is Adwar which means: A treatise about Dors. and the first half of this book talks about tones, intervals and modes.

The method of Montazamieh for making modes is to add a tetrachord to a pentachord. So first they explain what are the forbidden elements in the procedure of making tetrachords and pentachords and then they show how it is possible to add them to gather.

Four forbidden elements:

1. The first four degrees of a mode make an interval larger than a perfect forth.
2. Using all Adna intervals, which are tone, semi tone and quarter tone, in a tetrachord.
3. Using a quarter tone just after a semi tone.

4. Using two successive semi tones. (Maraghi, 2009, p.62)

Thus by avoiding these four elements, it is possible to make seven different tetrachords.You can find them in Table 3.2.

The second part of a Dor or mode, is a pentachord. It is clear that the first forbidden element lose its function when we want to make a pentachord. Safi Ad-Din also eliminated

1	T	T	S	
2	T	S	T	
3	S	T	T	
4	T	M	M	
5	M	M	T	
6	M	T	M	
7	M	M	M	S

T= Whole tone S= Semi tone M= Quarter tone

Table 3.2 Seven possible tetrachords

the second element, he mentioned the reason is a pentachord is large enough to distinguish all Adna intervals in it (Maref, 2004, p. 234). So there are 13 different pentachords that do not have any of the forbidden elements,Table 3.3.

1	T	T	S	T	
2	T	S	T	T	
3	S	T	T	T	
4	T	M	M	T	
5	M	M	T	T	
6	M	T	M	T	
7	M	M	M	S	T
8	T	M	M	M	S
9	M	T	M	M	S
10	M	S	T	M	M
11	M	M	S	T	M
12	T	M	T	M	
13	T	T	M	M	

Table 3.3 Thirteen possible pentachords

Now we have all tetrachords and pentachords and by adding them to each other we can have 91 modes. But before adding them to each other Safi Ad-Din talks about conditions of a smooth mode.

1. Addition should not cause one of the four forbidden elements. For example, adding the first tetrachord to the fifth pentachord causes the third forbidden element:

T	T	S	+	M	M	T	T

Table 3.4 Adding the first tetrachord to the fifth pentachord

2. For the second condition, first he explaines a concept by name of *Relation*. When one says, for example the second degree of a mode has two relations, it means this degree makes two Ala or Wosta intervals with two other degrees in the mode. So, for example in C Major scale, the first degree of mode has three relations, a prefect forth with F, a perfect fifth with G and an octave with C. By this definition he continues: "to have a smooth mode, the amount of relations in a mode should not be less than the amount of degrees in a mode." (Maref, 2004, p. 249)

I do not use the antonym of *smooth* for the modes that do not have these conditions and I want to call them, *not smooth.* The reason comes from an explanation by Abbas Maref, in his book *A commentary on Safi Ad-Din Ormavi`s Adwar*:

> Actually, having these two conditions is not mandatory, rather they only make modes smoother, and there is not any reason to call them wrong, for they consist of correct tetrachords and pentachords. No one can call them, even, not beautiful. The not smooth modes could be even more important than the other ones, because, although, playing them is much harder than the others, they can open our eyes to very new and magnificent musical horizons. (Maref, 2004, p. 250)

Then treatises talk about three kinds of mode:

1. Not Smooth: They have one of the forbidden elements or very low amount of

relations.

2. Pseudo-Smooth: They do not have any of forbidden elements but their relations are less than their degrees.
3. Smooth: They do not have any of forbidden elements, and they have same amount of relations and degrees.

Now for example if I want to add the first tetrachord to the first pentachord, and the first degree is a C, I will have these intervals and notes:

	T		T		S		T		T		S		T	
C		D		E		F		G		A		Bf		C

f = Flat

Table 3.5 The mode of first tetrachord and first pentachord

This mode is one the smoothest modes in Iranian music, because it has nine relations. Its name is *Oshagh* which means lovers, and nowadays Oshagh is the main mode of *Dastgah e Mahour*, which is one the 12 main parts of Radif.

If I add the fifth tetrachord to the fifth pentachord, consequently the result is:

	M		M		T		M		M		T		T	
C		Dk		Ef		F		Gk		Af		Bf		C

k= A quarter tone lower f= Flat

Table 3.6 The mode of fifth tetrachord and fifth pentachord

The name of this mode is *Hoseini,* and it is less smooth than Oshagh*,* because it has seven relations. Here we can see and understand the point which Abbas Maref mentioned about being smooth or not smooth. Because this mode, *Hoseini,* is the main mode of five parts of Radif, and among them there is the most important and largest part of Radif which its name is *Shour*.

In figure 3.7 and 3.8, you can see how did they show the modes. You can see also why they call them Dor, as I mentioned before Dor means cycle. The symbols out of the circles

show the notes and the line in the circles show the relations. As you can see in *Oshagh*, there are eight lines which mean it has nine relations (plus one for octave). And in *Hoseini,* figure number 2.8*,* there are six lines which means it has seven relations.

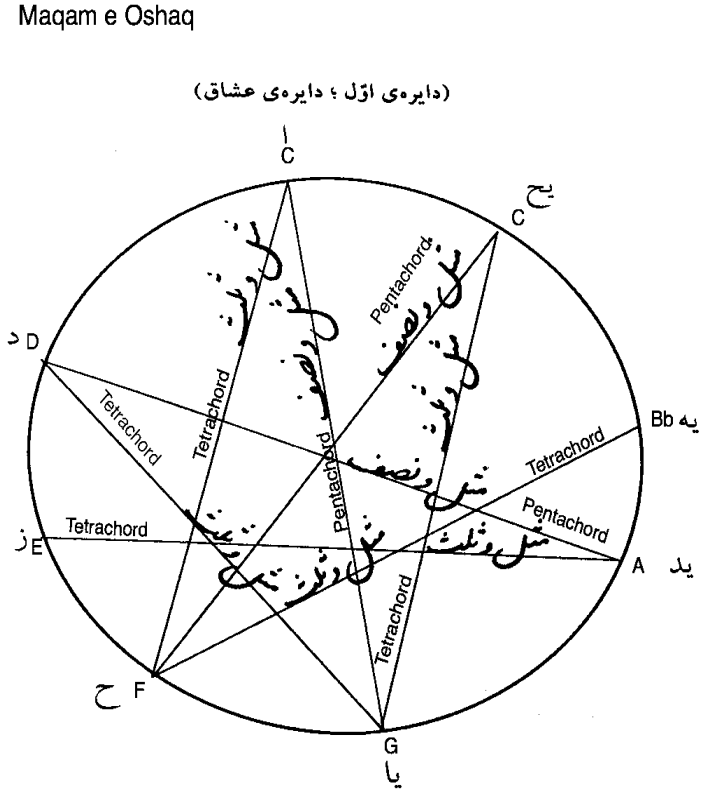


Table 3.7 Oshagh (Maref, 2004, p. 262)

3.3 Montazamieh and Rhythms

For showing rhythms and durations, Montzamieh musicians had six units:

1. Tan= Quarter note
2. Tana= Quaver+ Quaver
3. Tanan= Quaver+ Quarter note
4. Tāni= Quarter note + Quaver
5. Tananan= Quaver + Quaver + Quarter note
6. Tanananan= Quaver + Quaver + Quaver + Quarter note (Bardakci, 2010, p. 86)

Maqam e Hosseini

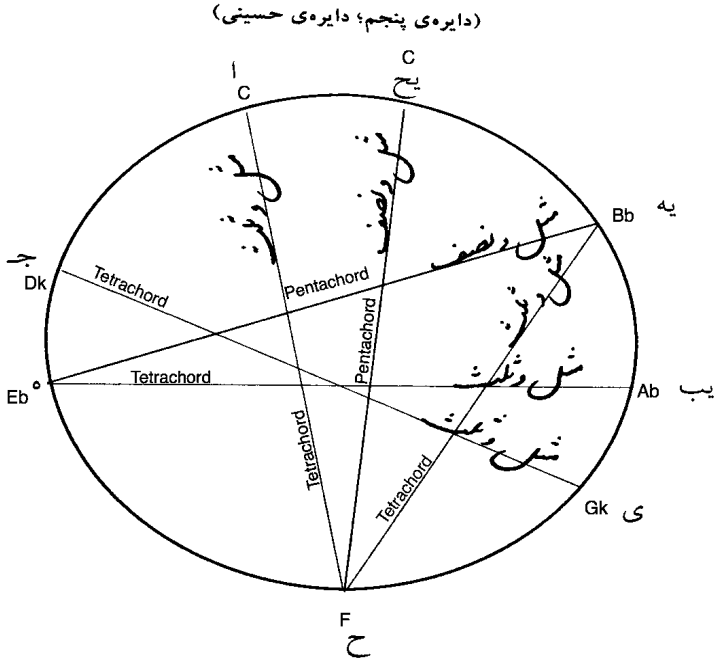


Table 3.8 Hoseni (Maref, 2004, p. 266)

For making a rhythm, one should put his/her desired units on a circle in his/her desired order.

For example *Shahi*, is one the circles which is composed by Maraghi. The units in this circle come in this order:

Tananan Tanan Tan Tan Tanan Tananan Tan Tan Tanan Tanan Tan

In figure 3.9, you can see the way that they used to show their rhythms. The figure shows *Saghil e Aval*, another rhythmical circle by Maraghi. The units in this circle come in this order:

Tanan Tanan Tananan Tan Tananan

In fact, it is not very correct to translate the units to Western notation, because they had another interesting technique, which makes it possible to compose any kind of rhythmic pattern by them. I mean for example, it is possible to make semiquaver or even quintuplet or

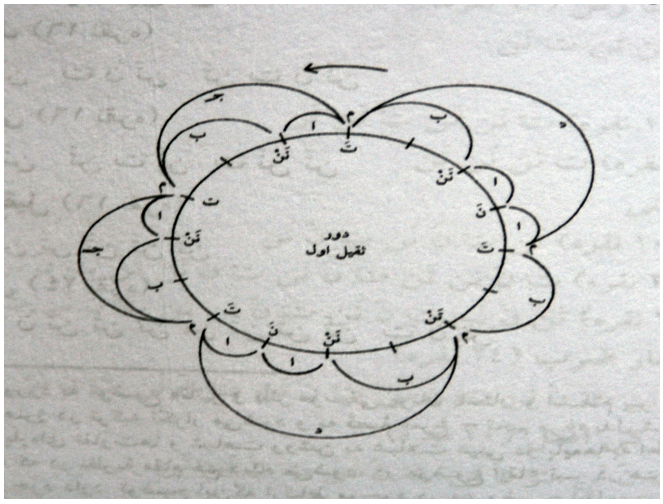


Figure 3.9 Saghil e Aval (Bardakci, 2010, p. 89)

sextuplet time intervals by them. For doing such a thing they compose an expansion pattern for their rhythmical circles. Figure 3.10 is one of these expansion patterns. Its name is *Chahar Zarb*. As you can see, the first and smallest circle has 12 beats, the next one has 24 beats, next has 48 and the last one has 96 beats. So as you can see the grow factor is two.

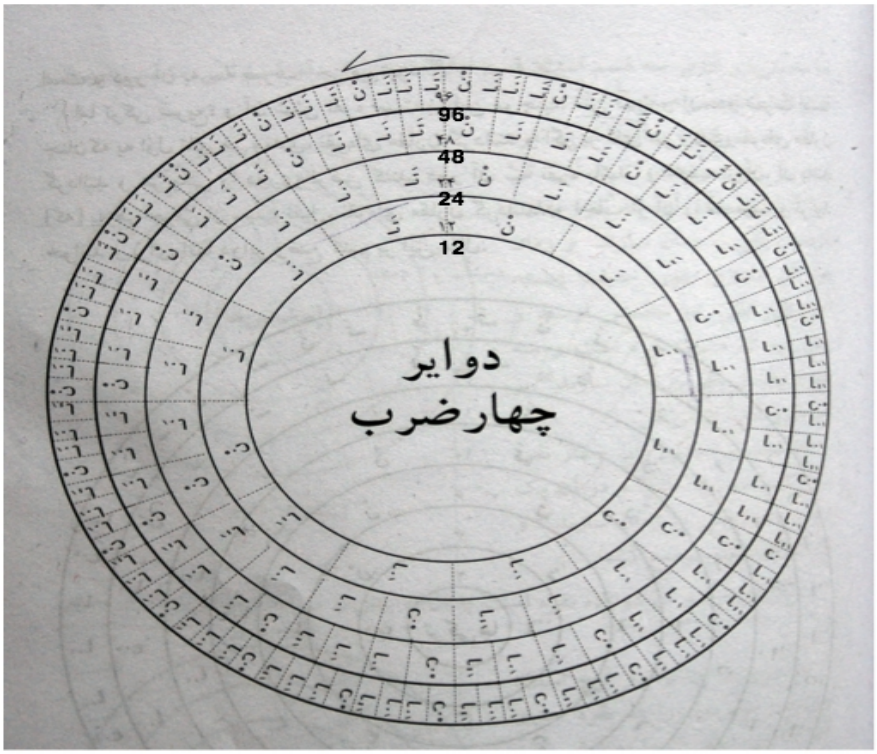


Figure 3.10 Chahar Zarb (Maraghi, 2009, p. 247)

The expansion pattern in figure 3.11 shows two beats for first circle, next has three beats, the third one has six beats, the forth one has 10 beats, the fifth one has 12 beats, the sixth one has 24 beats and the last one has 40 beats. So as you can see this one does not have a clear grow factor.

The another interesting point about micro-time structure system in Montazamieh style is a thing that I call it *possible score*. Besides the circles, they have another kind of score which is in fact the complimentary part of them.

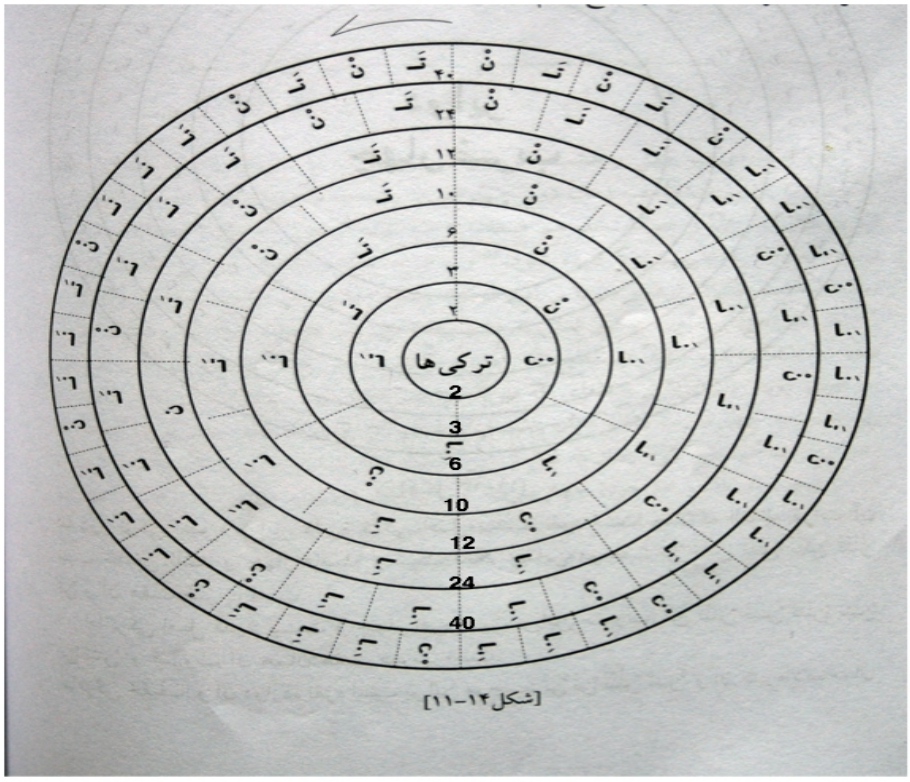
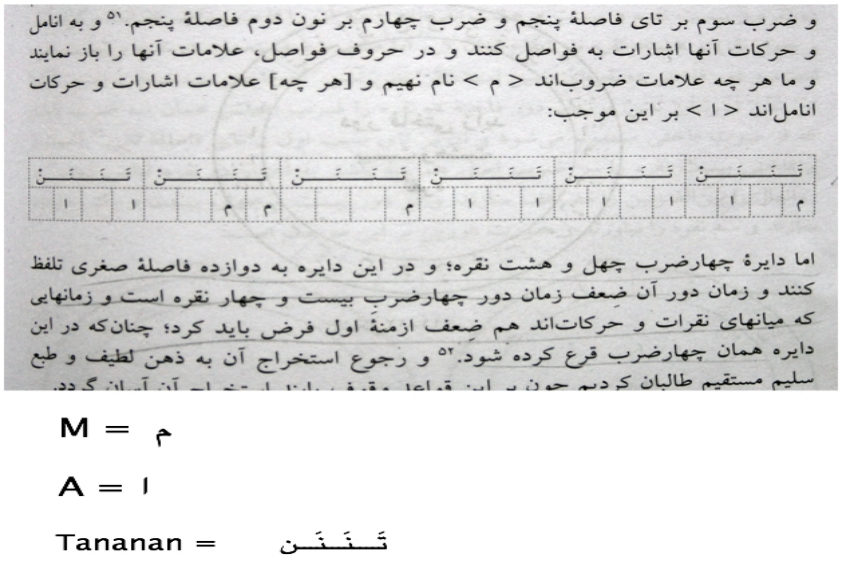


Figure 3.11 Expansion pattern without a clear grow factor (Maraghi, 2009, p. 248)

In possible scores, they divide their rhythmical cycles into the smallest possible unit and then they specified which beats should be played, which beats could be played and which beats should not be played. Figure 3.12 is a part of one of these possible score. In this one the M sign means they should be played, the A sign means they could be played and the blank squares should not be played.


و ضرب سوم بر تای فاصلهٔ پنجم و ضرب چهارم بر نون دوم فاصلهٔ پنجم.[۵۱] و به انامل و حرکات آنها اشارات به فواصل کنند و در حروف فواصل، علامات آنها را باز نمایند و ما هر چه علامات ضروب‌اند < م > نام نهیم و [هر چه] علامات اشارات و حرکات انامل‌اند < ا > بر این موجب:

تَـنَـنَـنْ	تَـنَـنَـنْ	تَـنَـنَـنْ	تَـنَـنَـنْ	تَـنَـنَـنْ	تَـنَـنَـنْ
م ا ا	ا ا ا	ا ا ا	ا ا ا	م م م	ا ا ا

اما دایرهٔ چهارضرب چهل و هشت نقره؛ و در این دایره به دوازده فاصلهٔ صغری تلفظ کنند و زمان دور آن ضِعف زمان دور چهارضربِ بیست و چهار نقره است و زمانهایی که میانهای نقرات و حرکات‌اند هم ضِعف ازمنهٔ اول فرض باید کرد؛ چنان‌که در این دایره همان چهارضرب قرع کرده شود.[۵۲] و رجوع استخراج آن به ذهن لطیف و طبع سلیم مستقیم طالبان کردیم چون بر این قواعد و قرائن [illegible] آن آسان گردد.

M = م

A = ا

Tananan = تَـنَـنَـنْ

Figure 3.12 Possible score (Maraghi, 2009, p.246)

3.4 Montazamieh and Radif

Undoubtedly, Radif, as the heart of Iranian classical music, has very strong roots in theories of Montazamieh. However, I think it is not possible to analyze Radif just by their theories, because now it is at least more than two centuries that Radif has its own separate life, and like any other phenomenon, it has progressed in its own way or even, may, has deviated from its origin. But studying Montazamieh, at least, can reveal the fundamentals and hidden logics of Radif. For example “there are more than 60 modes in Radif” (Farhat, 1990) , and all of them belong to the list of 91 modes of Safi Ad-Din. And among them, you can not find even one case of one of four forbidden elements occurrence. Searching through Montazamieh, also can give us more correct vision for looking at time structure and, specially, subjects such as possible score and expansion patterns are very helpful for exploring the roots of improvisation in Iranian music. Of course, as I mentioned at the beginning of this chapter, the main goal of this research is not to give a comprehensive analysis on Iranian classical music, rather it tries to find the hidden crucial points and logics. And studying Montzamieh could be a valuable source for tracking these hidden points.

3.5 Radif

Nourali Khan Broumand (1905-1977): "Indeed, Radif is extremely subtle and fantastic, such a unique thing that we had made it in Iran." (Nettl, 1987, p. 29) And then Bruno Nettl, one of his student, in his book *The Radif of Persian music* continues: " [...] I heard this sentence from him many times. He knew Radif as the main symbol and heart of Iranian classical music; as same as the subtle Persian carpet [...] is the heart of Iranian classical art." (Nettle, 2009, p. 29)

Undoubtedly, without men such as Broumand, Radif was completely forgotten today. He was one the guys in the first group, who was strongly resisting against Western music to preserve Iranian classical music.

He was not very familiar with other kinds of music, but today it seems his opinion about the uniqueness of Radif is very correct. Iranian classical music is quite similar to Turkish, Arabic and Indian music. But the core of Iranian music, Radif, is a unique phenomenon.

Radif is both, the repertoire of Iranian classical music and the theory of Iranian classical music. It has a very strong relationship with Iranian folklore, ritual and even popular music. All in all, we could say Radif is the musical memory of Iranians.

Radif, is a huge and coherent collection of melodies. The melodies have complex relationships with each other, and they have specific orders. There are different narrative and version of Radif for either instrumental and vocal music. Nevertheless, all of them consist of 12 parts which are called *Dastgah*. Each Dastgah has a main mode and consists of a collection of melodies, which are ordered in a specific way, and each of them has a special capability to produce new melodies. The term, Radif, in Persian means Order. And the order of the melodies in Radif is one the most important things that a musician should learn. For

example if somebody is improvising based on one of the Dastgahs, and that part has, let say 10 parts, he can eliminate some of them, for example play different parts in this order 1 3 4 7 9 and 10. but he cannot play them in this order 1 4 3 7 9 8 10.

These different melodies of each part called *Goosheh*. All of the Gooshes have the same value of potential for producing new pieces or improvisations. Some of these Gooshes` modes are different from the main mode of the Dastgah, which they are belonged to. There are 60 different modes in Radif.

It worth to talk about the different nature of mode in Iranian music. Although, it is possible to, theoretically, show the modes, it is very imperfect. Actually learning the mode is something very practical. Let me explain it by one of my old memories. I started to play Santour, an Iranian classical instrument, when I was six, and normally it takes a couple of years to start playing Radif. When I was 14 or 15, I started to learn Western music theory, meanwhile it was like a couple of years that I had started playing Radif. I can remember, a day that I asked my teacher, I mean my Iranian music teacher: "What is the mode of *Shour*[4]?" and he looked at me and then played *Daramd e Shour*, which is the first Part of this Dastgah, but I asked him “Would you please write it for me or show me the tones and their hierarchies?” and he played it again and told me: “This is the mode of Shour”. I can remember that I insisted and he played that part again and again and kept telling me, “It is not possible to write it, if I want to write it I would write this melody for you. However, even the written melody is imperfect, the mode of Shour is exactly the thing that I just played for you.” On that time I thought he does not know the answer, and wants to evade from answering me. But now I can see how naive I was, and how deeply he had understood the nature of Iranian music. In fact, all of the modes in Radif have a hidden core, or imaginary face. By playing the melodies, they may show themselves for a tiny moment, but it is not

4 Shour is one of the 12 main parts of Radif

possible to reach them as a concrete thing. Therefore, as soon as one tries to show them as a mode, he would, indeed, kill that imaginary face and hidden logic, and consequently, present an incomplete and superficial reflection of that hidden mode.

This hidden cores and logics are not limited to the modes. Any time an Iranian musician plays a Goosheh, he would play it in a different way. But the fundamental melodic structure would remain the same in all performances. Hormoz Farhat, an Iranian musicologist, says:

> All of Gooshes have a hidden melodic pattern, but definitely, it is not possible to find it as a concrete melody or theme, rather the only way to grasp it, is a long procedure of playing and practicing the melody. (Farhat, 1990, p. 45)

There are different types of Gooshes:

Daramad: Daramad in Persian means beginning and in Radif refers to a piece or a group of non-metric pieces which have a same mode. All Dastgahs begin with one of them. Their mode is the main mode of the Dastgah. Most of the Gooshes which are coming after Daramad/s have their own mode. Therefore, Daramad is the only part of a Dastgah which is specifically in charge of showing the characteristic of that Dastgah. And their melodies are always limited in a tetrachord.

Mode modulator Goosheh: I took this title from Bruno Nettl (2009), there are lots of different names for them, but I found this title more logical. However, the concept is more important than the title. As the title tells us, they change the mode of the Dastgah or the previous Gooshe. They are all non-metric, and they could be quite long or even could have different parts. They exclusively belong to an specific Dastgah and it is not possible to play them in other Dastgahs.

Tekkeh: It means piece. Usually, these Gooshes do not belong to an specific Dastgah.

It is possible to find them in all or some other Dastgahs. In different Dastgahs they have a more or less similar rhythmic and melodic structure. During an improvisation, the musicians do not change them that much and they could be metric or non-metric. But the Important point about them is that, they do not have a modal stability, so it is possible to play them in different modes.

In Radif, there are two other elements, which are something between an attitude and a Gooshe. Sometimes they are that long and significant, which is possible to call them a Gooshe, but most of the time they are more like an attitude. The important matter about them is that they show the quality of two important elements of Iranian classical music, ascending and descending.

Owj: The order of the Gooshes in a Dastgah, is in such a way that the range of the tones are always moving from a lower degrees to the higher ones. The whole procedure of this upward melodic motion is called Owj, for example if a musician disobey this system and during the improvisation in a Goosheh use lower degrees than the previous Goosheh, the audience would say the Owj was imperfect. But beside this, more or less, near to the ending parts of Dastgahs, there is a Gooshe with the same name, Owj, which means the climax of the Dastgah.

Foroud: Foroud is, almost, a melodic cadence, which uses the main mode of the Dastgah. All of the Gooshes in a Dastgah, end with a Foroud. The musician who wants to do an improvisation, is quite free to compose his own melodic pattern for Foroud, but ones he/she plays it in his improvisation, he/she can not change it that much during that improvisation. Because, Foroud is the element which connects all the different parts of his/her improvisation. In fact any new Gooshe in a Dastgah introduces a new mode, but at the ending part of all of them, by Foroud, they return to

the main mode of the Dastgah, and next Gooshe introduces another new mode and returns to the main mode again. It is also possible to make a quite long Foroud to use it as a separate Goosheh. Foroud as a Gousheh should be always the last part of improvisation. In figure 3.13 there are some examples of different Foroud in *Dastgah e Chahar Gah*.

The fascinating point about Owj and Foroud, in my opinion, is the different overall shape of them. I tried to show my idea in figure 3.14. As you can see the ascension in Iranian music happens very slowly and it is a general or I can say a universal phenomenon. It is not possible to understand it by focusing on the details and it happens just one time. But on the other hand descension is a short repetitive motion. Thus, there is one Owj, but plenty of Frouds.

Obviously, there are other types of Gooshes, attitudes, characteristics and issues in Raidf, but here I tried to show a scheme of Radif, and give an overall view of its elements.

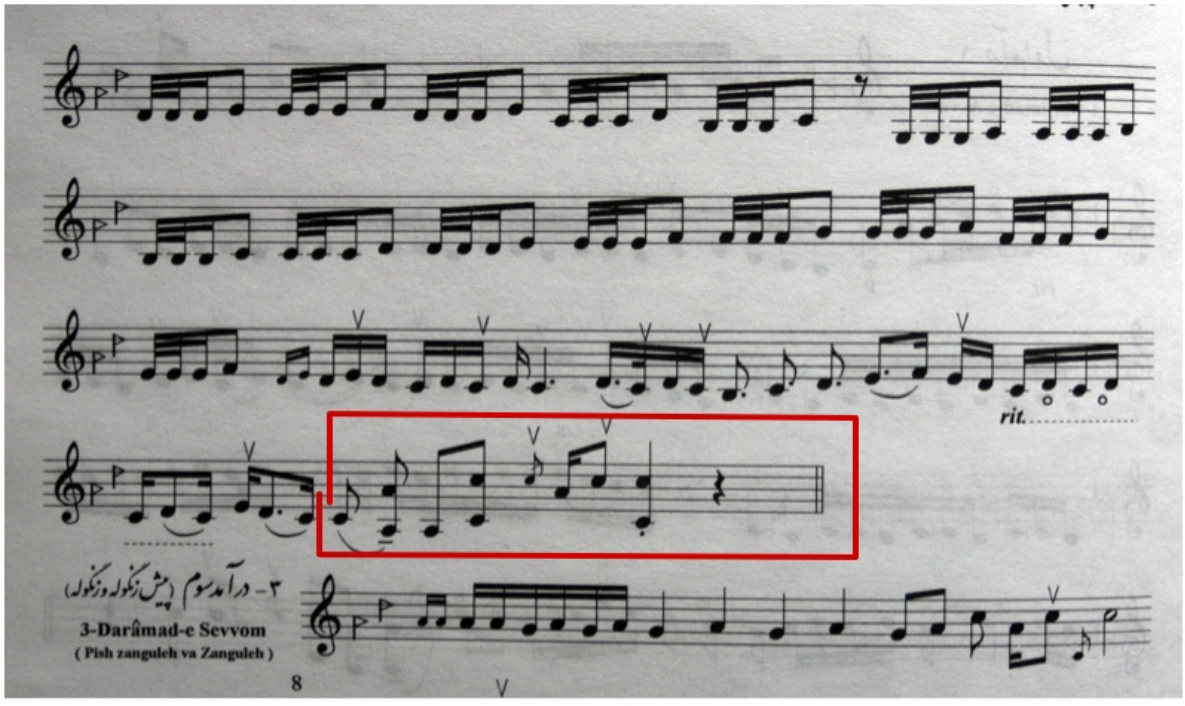


Figure 3.13a Foroud in different Goushes of Dastgah e Chahar Gah (Behdjat, 2000)

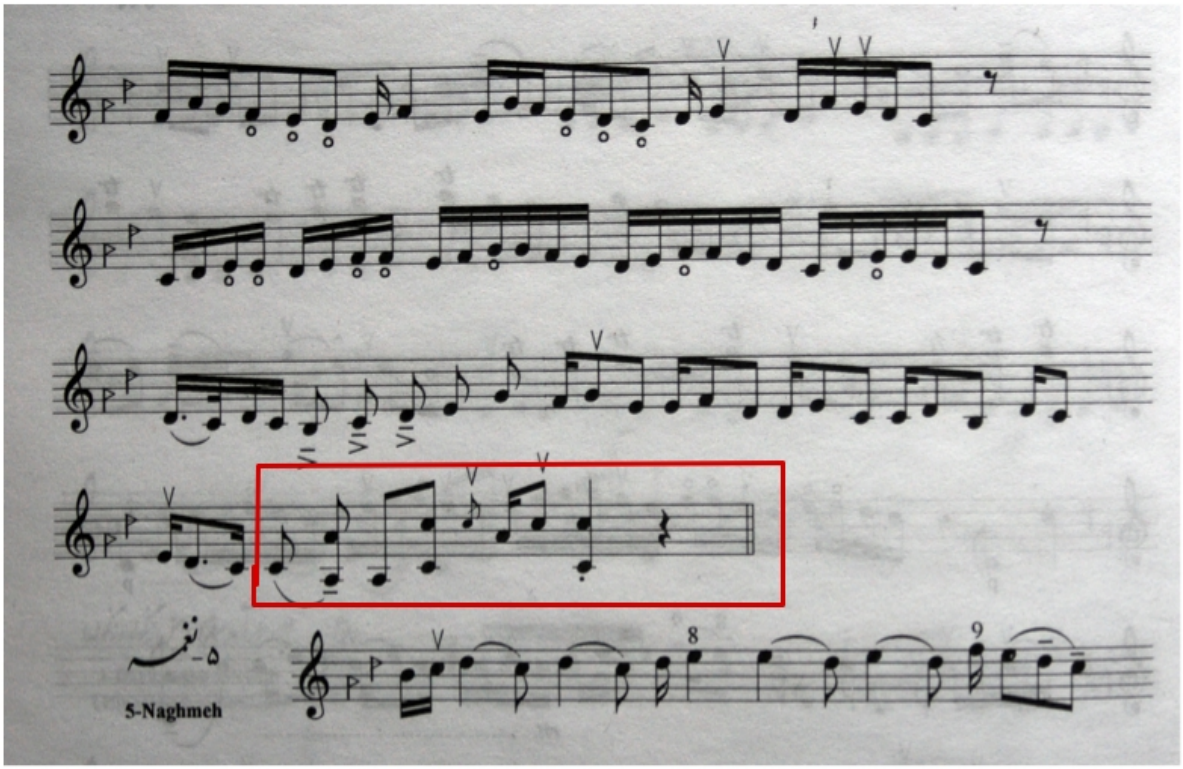


Figure 3.13b Foroud in different Goushes of Dastgah e Chahar Gah (Behdjat, 2000)

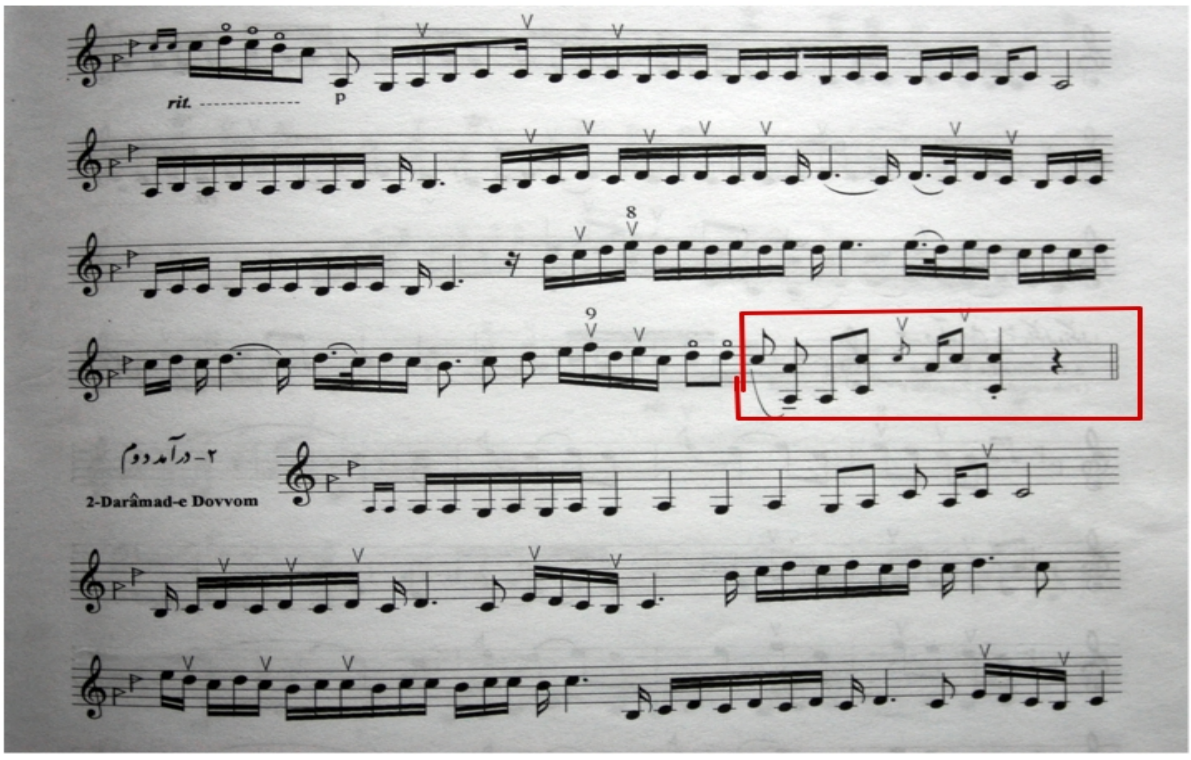


Figure 3.13c Foroud in different Goushes of Dastgah e Chahar Gah (Behdjat, 2000)

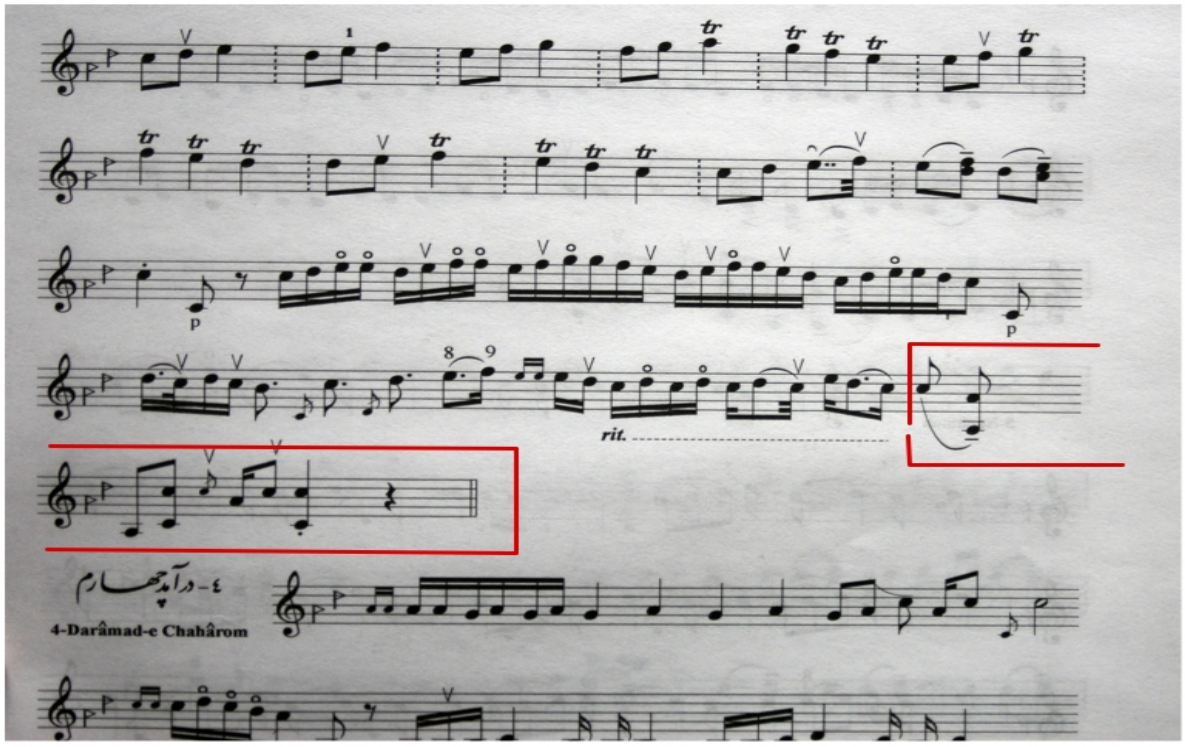


Figure 3.13d Foroud in different Goushes of Dastgah e Chahar Gah (Behdjat, 2000)

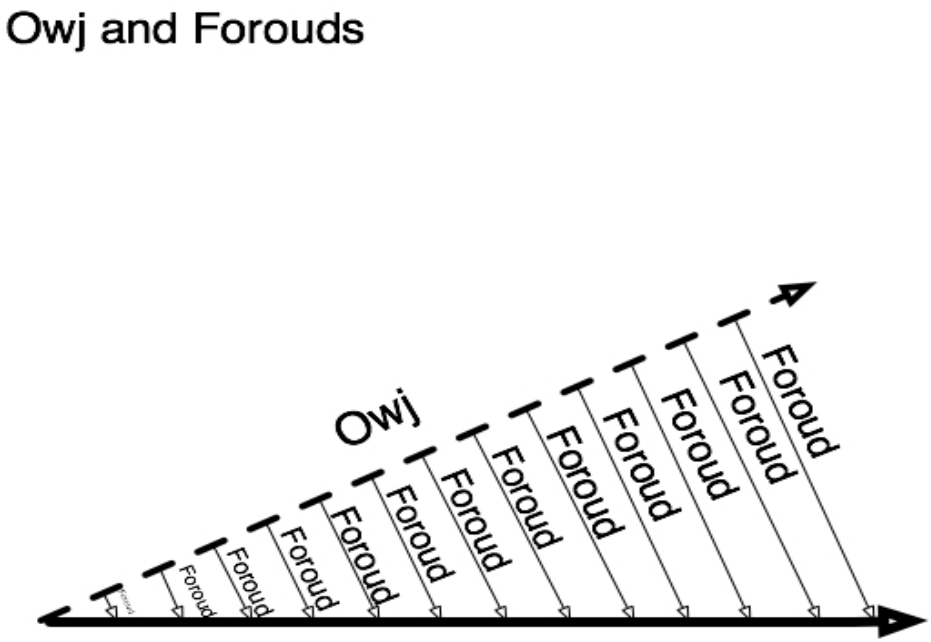


Figure 3.14 Owj and Forouds

3.6 Exploration of Sufism as a Cultural Source for Iranian Music

As I said before, one of the main goals of this research is to find the roots of the logics of Iranian music. Undoubtedly, lots of them have cultural roots. Sufism is one of the most important roots of Iranian culture. Specially, since most of the Iranian classical artists, musicians and poets were Sufi, I can say Iranian art, music and literature have very strong roots in Sufism. I believe the sufism attitudes still, consciously or unconsciously, live strongly in Iranians` mind. This strong presence of Sufism in Iranians` life and mind is so important that Abbas Milani, an Iranian historian, claims it is not possible to understand anything about Iranians without knowing about Sufism. (Milani, 2004).

Obviously, neither I am a Sufsim specialist, nor we have enough time to talk about such a complex and old phenomenon. So, I just want to give a very fundamental and basic introduction about it.

Sufism is an Iranian, flexible, religion or attitude. By flexible I mean something like Buddhism. The main reason for their flexibility is the fact that oppose to the normal religions, they eliminate their history and try to be just an ideology.

In Sufism the perfect human, Sufi, is a pure lover and his main goal is pure love. It is very hard to talk about pure love but somehow it means to love, love itself. Sufi should always, I mean in all moments of his life, just thinks to his love. He should avoid from the things which break his concentration. The first thing to avoid for a Sufi is society. Therefore, Sufis are very dissociable and individualist (Milani, 2004). The second thing to evade is their body. Taking care of their body and their physical desires, breaks their concentration. Thus, they do not care what they eat, or wear, or how they look. The last thing that they try to avoid is their mind or logic, because human physical and earthy logic can not understand Sufist behaviors.

The profession of a Sufi should also revolves around the same idea, he should not make or do anything which satisfy human`s physical desires. Here we can see the reason of Iranian artists, musicians and poets tendency to Sufism. A perfect Sufi profession is very similar to an artist. Nobody can eat a painting, have sex with a piece of music or wear a poem. In fact, logically, they are all very useless. Nevertheless, the procedure of composing a piece could be more complex than cooking a food. I mean doing useless things does not mean to do a simple thing.

One of the fundamental issues in the ontology of Sufism is their perception of universe. They believe there are two universes, the great universe and the small universe. The great universe is the universe as we know it, but the small universe is the human him/herself. The small universe is a miniature scale of the great universe. Therefore, essentially they are the same. A Sufi, by observing the world, gets extremely astonished, first of all by the density of the complexity of patterns, colors and sound in the world and second of all by feeling of having the same things in him/herself. Sufi has this tendency to show these complexities and unity. But not by copying them in a naturalist form of art, rather as the God of the small universe, Sufi wants to reproduce the same complexity with a Godly manner and by a symbolist art, and with a Godly innovation and creativity (Ardalan & Bakhtiar, 1973). And since Sufi is the most perfect creature of the great universe, he should show his maximum ability. Thus, a piece of art should be as complex and organized as possible.

The only thing that a Sufi communicates with is love. This communication happens by a specific language, pure language. It is not easy to understand what they mean by pure language. But, since it shows itself in art as geometry, in literature as poem and probably in music as algorithmic composition, I can say, it should be something close to mathematic. The only way to have this language is to have wisdom. As I said, the logic is an evil for a

Sufi. Instead of logic they try to grasp wisdom (Ardalan & Bakhtiar, 1973). By wisdom Sufi does not think, learn or analyze. Sufi just knows everything, without any reason.

Consequently, the action of a sufi should be heterogenesis and instantaneous. Because as I said Sufi does not think, Sufi has everything. He/she knows the beginning and the end. He/she should just throw the truth out of his/her heart.

But if wisdom is the source of all of these things, how it would be possible to grasp it? Actually, It is not possible to learn or teach wisdom. It is only possible to experience it in a specific way. This way has a specified hierarchy and order. It has seven levels, and starts with desire and ends with perdition. At each level, Sufi loses a part of his earthy or physical being and become more spiritual. And at the final level, perdition, he would be turned to a pure spiritual being. The hierarchy of levels is called *Tarighat,* which means way. The destination of this way is *Haghighat*, which means truth. But this way is not one dimensional. As I said there are two universes. Therefore, Sufi should pass this way in both of them. So, there are two important motions. A Sufi in great universe should expand himself to the infinity of the space. And in the small universe, which is himself, he should squeeze himself to a point which is called *Hidden Treasure* (Ardalan & Bakhtiar, 1973). So as he/she moves upward to the infinity of the space, he should always descent and dive inward through inside of himself.

3.7 Morphology of Concepts in Context of Iranian Classical Music

In this part I want to talk about five fundamental concepts in Iranian classical music. In my opinion these five issues are generally the main issues of all kinds of classical art and music. Here I am trying to talk about them in context of Iranian classical music and specially show the strong relationship of them with Sufism as one the main ideology that has been

magnificently influential during the evolution of Iranian culture.

I. **Perfection**: Perfection is one the main goals of most of the classical forms of art. However, each of them has a different perception of it. As I said before, Iranian art strongly derives its concepts from Sufism. In Sufism perfection is a perfect unity. Unity with the universe or I can say everything. The only way to reach such a unity is perdition. One should first of all destroys himself, in sake of dissolving the self to another thing/s. As long as one has a separate self, the unification is imperfect. Thus, the one should first of all destroy the self. In sufism this destruction happens by a spiritual death, perdition, which is the last level of the path to the truth, based on Sufism.

Therefore, perfection in Iranian music appears as unification. I found this unification in two areas. The first unification occurs between the musician and his/her instrument during the procedure of learning music. He should learn how to treat the instrument as a part of his body. This unification happens in the music itself, and by playing and creating music without thinking and preplanning. It is very similar to the way that one treats his/her hand, he/she never thinks about how to move his/her fingers, he/she just moves them, or never thinks how to think, he/she just thinks. So, this unification happens during the procedure of learning music and results in improvisation.

The second unification happens after the learning procedure, and during a performance, between musician and audience. In the past, the audience of Iranian classical music were from the elites, and most of them were musicians or at least very professional music listeners. During a performance the musician and audience should put themselves in a same mood. The audience should follow all the tiny details of music, and some how all of them should improvise in their mind. A good musician should constantly keep the audience in the mood. This situation needs a very deep concentration by audience, because they should

keep themselves in the mood either. Being in the mood means forgetting about time and place, and just strongly following the melodic lines. A kind of mood that they call it spiritual mood. For understanding this unification, imagine in a performance a musician is improvising and the audience also subjectively improvising, and both of them play exactly the same tones. This is the joy of Iranian music, sense of unity. In such an ideal situation there is not a musician and audience, rather there is a unified self and a common sense, which is called spiritual mood. The worst thing is to give audience a surprise and throw them out of the mood. Here you can see one of the fundamental differences between Iranian music and Western music, Iranian music is a surprise-free music.

II. **Freedom**: Freedom in Iranian music shows itself in two shapes:

1. Rhythm: Most of the parts of Radif and consequently Iranian music are non metric pieces. An Iranian musician, although, should always stick to the hidden rhythmic patterns or as Dariush Safvat (2010) calls it, the sprit of rhythmic patterns**,** the musician is quite free to change them and to use verity of different patterns. This freedom, makes it possible to create different characters by the same material, and in different situations, musician could play the same part of Radif, but he/she should tune it to the atmosphere of the place and audience.

2. Improvisation: The second place that the freedom shows itself is obviously improvisation. Improvisation is the highest and final goal of Iranian music. In context of Iranian classical music, traditionally there are three types of music.

The first one is to only play Radif as one has learned it from his/her teacher/s. Therefore, he/she tries to stick to his/her teacher/s style as much as possible.

The second way is to do an improvisation based on different parts of Radif. So, in this way the musician changes the rhythms and ornaments, or some other aspects, in a very specific way that has learned during the long course of his music practices.

The third way is pure improvisation which have been the only goal of Iranian musicians for thousands of years. I can say, the real Iranian classical musician should improvise without any preplanning, thinking or specific pattern, without even thinking about the imitating or doing his predecessors, he could just get inspired by them. Real improvisor should just do the music and create it at each moment of his performance. The goal of playing Radif is to learn how to do a pure improvisation. Dariush Safvat, an Iranian musician and musicologist says:

> Radif, except its melodies and motives, has another element, Spirit. Which seems to be forgotten these days.The main objective of learning Radif is to grasp its sprit. Once, you obtained it, all things you play in any way are pure Radif. (Dariush Safvat, 2010, p. 107)

III. **Balance**: The most important function of balance in Iranian music is to eliminate the excitements. The excitement breaks the mood and is one the worst things to happen in an improvisation. There are different ways to keep balance in Iranian music:

1. Repetition: Repetition decreases the level of novelty. Safvat (2010) claims that the repetition prepares mind for receiving the spiritual messages, or by my lexicon it prepares mind for the desired rapture mood of sense of unity. It is possible to find repetition in many aspects of Iranian music, repeating a rhythmic pattern with slight changes, repeating an specific motif at the end of the all parts of improvisation and etc.
2. Rhythmic contras: Generally, intensive contrasts in all aspects of Iranian music is not allowed. The limit for the maximum contrast in terms of rhythm is more or less 50 percents. Let me explain it by figure 2.15. Iranian musicians in old times used to count the rhythm by numbers in a specific way. In their way the smallest unit in a piece has value of one. So for example in case of the first motif of the figure 3.15

which the rhythmic contrast happens between an eighth and a sixteenth notes. We can say two plus one equals three. Now if we scale it to one hundred the result is 66.7 plus 33.3 equals 100. And now if we subtract them, 66.7 - 33.3= 33.4 , the answer is almost 33 percent Which is less than 50 and consequently legal. In next example the difference of the durations equals 50 percents, so it is legal either. But in the last one as you can see the difference is 75 percents which is illegal in Iranian music. Thus, as you can see, the rhythmical contrasts are very soft in Iranian music. It worth to mention that, firstly I am talking about fundamental notes of melody, and not for example ornaments. And secondly I am talking about rhythmical units within a musical sentence.

3. Dynamic: The other place that balance shows itself is dynamic. Iranian musicians use a very limited range of soft dynamic, and they strongly avoid sharp dynamic contrasts in their music.
4. Upward melodic motion: As I explained before, in Iranian classical music an improvisation always begins with lower pitches and during the improvisation the pitch is moving upward to reach the highest possible tone. This movement happens very gradually. So, I do believe one of the function of this gradual upward motion is to keep the balance of pitch in an improvisation.

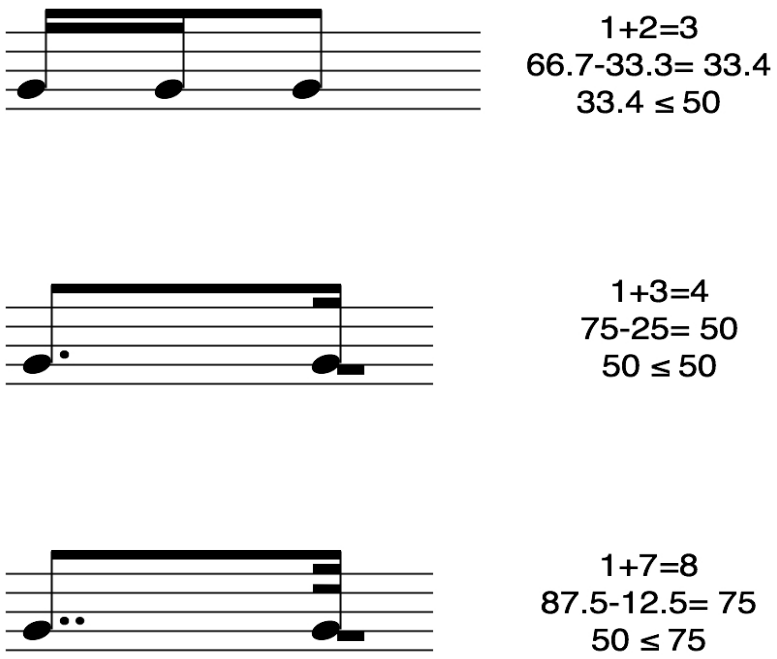


Figure 3.15 Rhythmic contrast (Safvat, 2010, p. 97)

IV. **Technique and style**: Sufist art consists of two main parts, technique and *Hāl*. Hāl is a concept that you can find it in all aspects and works of Sufis. In literature, poetry, architecture and music, Sufis always talk about Hāl. I could not find a good English translation for this word, Safvat (2010) translated it in French to *Etat d` ame* which means State of mind**.** Although the translation is correct, in my opinion it is not complete. If I want to give a definition I would say it means (Orgasm – ε). In fact, Hāl is that unexplainable thing that you feel it under your skin when read a sophisticated poem, or listen to an astonishing piece. Definitely, Hāl is a quality not a quantity, so it is not measurable. It is just there, under your skin, and you can feel it. At that moment you do not scream, you do not move and you do not think, because, simply you can not. Any movement, except its flow, will destroy it. So you just get frizzed and astonished by the moment. Very similar to the tiny moment of (Orgasm – ε).

There is a very important moment in a Sufi`s life. The moment of touching the truth. In Sufism, oppose to the holy persons in religion, who were borne innocent and holy, the Sufis are very normal persons and sometimes they even have sinister personalities. But this moment completely changes their life. At this moment the Sufi suddenly get astonished. The thing which astonishes him is nature, world, universe, environment, himself, or I can say something in common between inside and outside of him/herself, something between the small and great universe. At that moment Sufi feels that power, energy or core which holds the molecules of a stone together, and feels the same energy in a poem which firmly keep the words and syllables together, but it is not in the words, rather it is something between the words and syllables, and feels the same strong power, which is radiated from the core of cosmos and keeps the whole universe, and then feels the same tension in himself, a hidden core inside himself, hidden treasure. It seems that all of them are different harmonics of one tone, so if someone resonates one of them, they all start to resonate. Hāl is something like fire in charcoal and light in the air. Experiencing such a feeling, a Sufi wants to feel it again and again, and not just for a moment, rather wants to feel it in all moments of his/her life. So, he/she seeks for tools that could put him/her in this mood, and music is one the most powerful ones. This is the reason that Iranian musicians and music listeners do not look for a surprise, for definitely it would break their rapture.

The direct effect of this matter, is the superiority of style to technique. By style I mean the way of playing not a specific style. The interesting point about learning Iranian music, specially in old days and before appearance of new methods for the beginners, is the fact that the students, from the first day, play the same thing that the teacher plays, and keep play that for whole their studentship procedure (Safvat, 2010). After a while their fingers become nimble enough to play the exact tones and notes, so the difference is not the notes that the

teacher plays. I want to say, there is not like a simple Radif and then a normal Radif and finally a complex and hard Radif. They are all the same, the thing that a student should learn is the way of treating the tones. He/she should grasp the sprit of Radif. The core which holds all of these tones as a totality, which is not the tone itself, rather it is the quality of playing or a way of playing which could resonate that hidden tone. There is a famous story about one of the most prominent legendary Iranian ancient musician and scholar, Farabi, who lived in ninth century. The story talks about a night that Farabi were performing an improvisation. He played something and made all the audience to laugh, I mean a crazy kind of loud laughter, and then after a while made them to cry in a same crazy way, and then all of them fell in a deep sleep. Then he carved his name on the instrument and put the instrument there and left the place. Beside the originality of the story and probably the exaggeration of the real story, the matter that I want to point is, in context of Iranian music, the question is not, "What did he play on that night to do such a thing?", but in the context of Iranian music, the question is "How did he play?".

So, it does not matter how fast and clean you can play, and there is not a concrete ideal form to reach. On the contrary, there are infinity ways for playing it and musicians should just show that quality. Exactly like the power which shows itself in a stone, a leaf, a human, a piece of art, cosmos and all in all in infinity patterns. However, it is not the only reason for avoiding technique, there are other reasons, and I will talk about them in the next part.

V. **Cause and effect**: The last thing that I want to talk about in this part is cause and effect in context of Iranian classical music. This issue is one of the key concepts for understanding Iranian music. This axiom, cause and effect, is one the fundamental reasons of mankind developments. Generally, humans` science tries to explain the causes by exploring the effects. As I know all the ideologies, in different ways, have accepted this axiom.

Theological ideologies believe in the cause of causes, which is God, and all of the long chains of causes and effects finally end in this cause. And non-religious ideologies, more or less, believe in infinite sequences of causes and effects. But as I said all of them accept the existence of such a phenomenon.

In sufism the story is completely different. Sufis do not believe in cause and effect. In fact they do not reject it, rather they deny the existence of such a thing. They do not even talk about it. The reason is quite clear, because accepting the cause and effect will make a large paradox in their idea of being and existence. As I said, Sufis believe in just one being, one existent, which is in fact everything. Thus, for them everything is only one thing. For accepting the cause and effect axiom, we need, at least, two things, a cause and an effect. So, as I said they do not even talk about it, because some how they can not see it. But this not-believing, shapes many aspects of Sufis` works in different fields. Let see how it shapes Iranian classical music.

Generally in music, there is a composer who composes music by an instrument, or writhing a score or designing an algorithm. And the players play the score by their instruments, and the audience listen to the composition. Here you can see one of the fundamental reasons for monophonic texture of Iranian music. Because first of all, the composer should not be a cause for another persons, which are players. Consequently, since he/she could just play one instrument at once, to unify the composer and players. More over, as I said the musicians during the procedure of learning music, should learn how to treat their instruments as a part of their body, so they do not see any instrument when they are playing it. This could be a reason for considering singing as the most complete way of playing music and all the other instruments try to imitate it, because the instrument of singers is really a part of their body. And more over there should not be any concrete composition or even

preplanning which causes the music, it should be just a pure improvisation. And also, this is the reason for the matter that the musicians, in old time, used to sit among the audience, and not in a special spot. And also in a performance musician and audience all together, objectively or subjectively, improvise. Because there is not a performer and an audience. Here is another reason for evilness of technique in Iranian music. Because, the performer by showing his/her techniques wants to present him/herself. This presentation has two unwilling issues. First issue is presentation itself, because a performance is not a presentation, it is just an in common sense. And second one is presenting the self which is exactly the thing that breaks the audience mood. During the performance they do not want to see improvisor and they also do not want to remember that he/she is another person. And the musician does not want to feel himself as a separate being during the performance, either. Thus, during the performance, the improvisor is strongly trying to kill his role as the omnipotent of the scene, and also trying to destroy himself. Thus his main goal is self-inexistency.

This is not the only place that a Sufi musician tries to destroy himself. He should also try to destroy it in his normal life. He should not make money out of music, so he should get another profession and live just like others. For example, Jean During, French musicologist, in his book *Tradition and evolution in Iranian music* says:

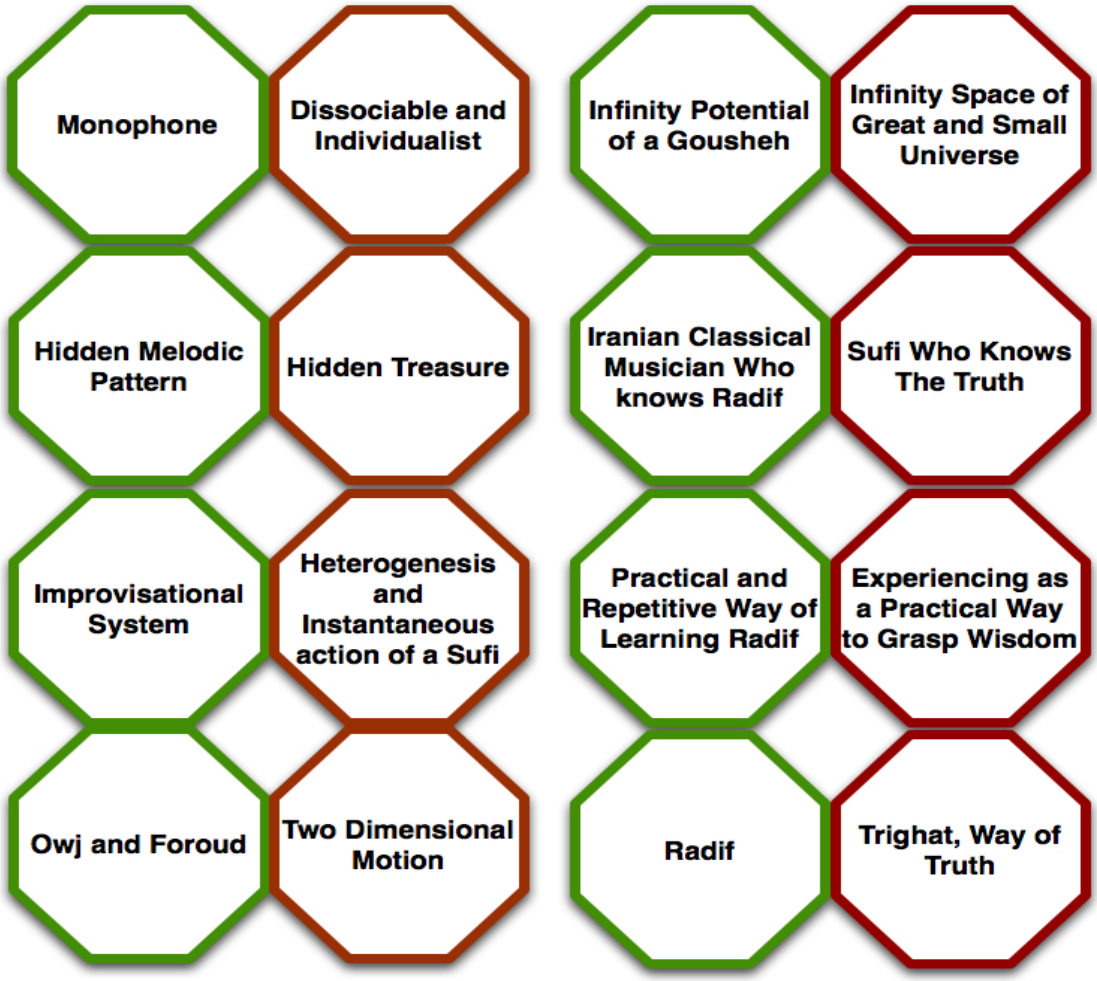
> The most special and unique aspect of Iranian music is *Individual Performance*. The sophisticated and brilliant musicians, who have never played for anyone else except themselves, are not scarce in Iran. Special musicians, who at best may just teach music to some students. (During, 2004, p. 34)

3.8 A Comparison Between the Elements of Iranian Music and Sufism

In the last part of this chapter I want to present a short comparison between the

elements of Iranian music and Sufism. Of course, it is not a comprehensive comparison, rather my idea is to show the similar roles, concepts, elements and actions in both of them.You can see the comparison in figure 3.16. The green octagons are Iranian music elements and red ones show the elements of Sufism. As you can see for example, I connected monophony of Iranian music to the individualism of Sufism, hidden melodic pattern to hidden treasure, improvisational system of Iranian music to the heterogenesis and instantaneous action of Sufi, Owj and Foroud to two dimensional motion of a Sufi on the path of the truth, infinite potentiality of a Goosheh for producing new music to infinite space of the great universe, Iranian musician who knows Radif to Sufi who knows the truth, the practical and repetitive way of learning Radif to experiencing as a practical way to get wisdom, and so on.

By this chapter, I mean finding and categorizing these concepts in Iranian classical music, I do not mean to follow them as they are, rather I think an Iranian musician who seeks for a new way, should know them to understand the roots, fundamentals and constitutional constructions of Iranian music. For, as I said before, many of them still exist in Iranian culture. They could be deformed or changed by many aspects of modern life, but still have that essence in their very hidden layers. Finding these roots is the first step, because if we want to use them directly, the result is going to be Iranian classical music again. So now the question is, “How is it possible to bring them to or find them at the present time?”



Figue 3.16 Comparison between Iranian music and Sufism

Chapter Four

Two Different Approaches

This chapter is about the approaches that I have done during the first and second year of my master program. As the title of chapter shows, approaches are very different. I will talk about the approaches under the title of two pieces. *Rainbow in Azidahaka`s eyes* is the piece that I composed at the first year. In the first year I tried to make an artificial Iranian improvisor by designing an algorithm which is a mixture of two principles, *Hidden Markov Model* and *McCulloch-Pitts units*. Then I designed another unit, *Cancer,* which tries to destroy this algorithm in a specific way. The main objective of this piece was to move toward the borders of issues such as being correct, wrong, damaged and creative. The title of the piece that I have been working on it in the second year of my master program is *"Adieu DNA" Keykhosro said.* In the second year I have tried to mostly emphasize on the conceptual elements of Iranian music in order to design some scores for improvisation. The designations of the scores are strongly derived from sources such as old theories of Iranian music and Sufist symbolism. Nevertheless, they let the improvisor to go beyond the traditional realms of Iranian classical music.

4.1 Rainbow in Azidahaka`s Eyes

The main idea of the piece constructed based on this assumption: Since many aspects and logics of Iranian classical music are hidden and unreachable, it is not possible to directly

modulate them. But, If it would be possible to design an algorithm/s which is/are capable of improvising based on Iranian classical music, then by composing another algorithm which is capable of challenging and interfering the former one/s, consequently, it would be possible to modulate the logics of Iranian classical music.

Regarding to this idea, based on a piece of Radif, *Daramad e Avale Shour*, I made seven cells which can improvise within the context of Iranian classical music. I divided that piece to seven parts[1]. I made an algorithm, which I call it *Cell,* for each part. Each algorithm can play its own piece of melody. It is possible to control the Cells in terms of their pitch, rhythm and intensity. Controlling does not directly affect pitch, rhythm and intensity, rather controlling happens by changing the status of cells between being correct or wrong, or also I can say conservative or creative. Obviously, this controlling does not happen in a linear way.

There are different types of generative algorithms such as Neural Network, Genetic Algorithm, Generative Grammars, Hidden Markov Model and so on, for designing Cells with aforesaid features. There are particular reasons that I chose Hidden Markov Model. First of all, I needed an algorithm which is capable of performing an improvisation based on a specific piece of melody with a specific mode. Consequently, the alternatives for each position is a limited and small list of values of pitch, duration and intensitiy. Thus, I did not need to compose a huge network with multiple layers and states, rather a HMM with just one hidden layer was fully sufficient in my case. The next reason for using HMM, which was very important, is the fact that based on my idea I wanted to treat each position individually and free from its previous and later positions in the output list. Therefore, since the states of the output layer of a HMM are not connected to each other, HMM was very suitable for my idea. And finally, I wanted to design the algorithms in Max environment. And I knew that it is

1 The reference to figur out the musical sentences and dividing the melodies of Daramad e Aval e Shour was *Radif of Mirza Abdollah, pedagogical and analytic notation* By Dariush Talai (2006).

not possible to make very complex units and states in Max. One of the main features of HMM is the fact that in a calculation procedure, it tries to shift the complexity of calculation from states to the structure and designation of network. Therefore, units in a HMM most of the times perform very simple calculation such as summation or multiplication. More over its former applications in context of algorithmic composition were quite similar to mine. For instance, “Martin Hirzel and Daniela Soukup generated jazz improvisations based on small patterns, which are processed by a HMM [...] Mary Farbood and Bernd Schoner applied hidden Markov models to generate various counterpoints in relation to a given cantus firmus.” (Neirhaus, 2009, p. 77). Now let me give a brief description of Hidden Markov Model, and then I will explain the way that I used it in Cells regarding to my idea.

4.2 Markov Chain

Maorkov Chain is a memoryless random precess. By memoryless it means in Markov chain conditional probability distribution for the system at the next state depends only on the current state of the system, and not additionally on the state of system at previous steps (Neirhaus, 2009). Figure 4.1 depicts a very simple Markov chain. This is the daily life plan of a person. It does not depend on any thing but the wighted chance of transition between the different plans or states of the network. All states are fully connected to each other. The states and outputs are the same. As you can see it can be started from any state. State changing procedure does not care about the previous transitions, it could just be affected by the current state and its wighted connection to the other states. The transitions could be continued for infinity.

Let me give an example: Imagine the person`s plan for today is walking, therefore

tomorrow for 30 percents he/she will walk again and he/she has 40 percents of chance to study, and the amount of probability for shopping is 30 percents. So it does not matter what he/she had done the day before, and the procedure can go on for ever.

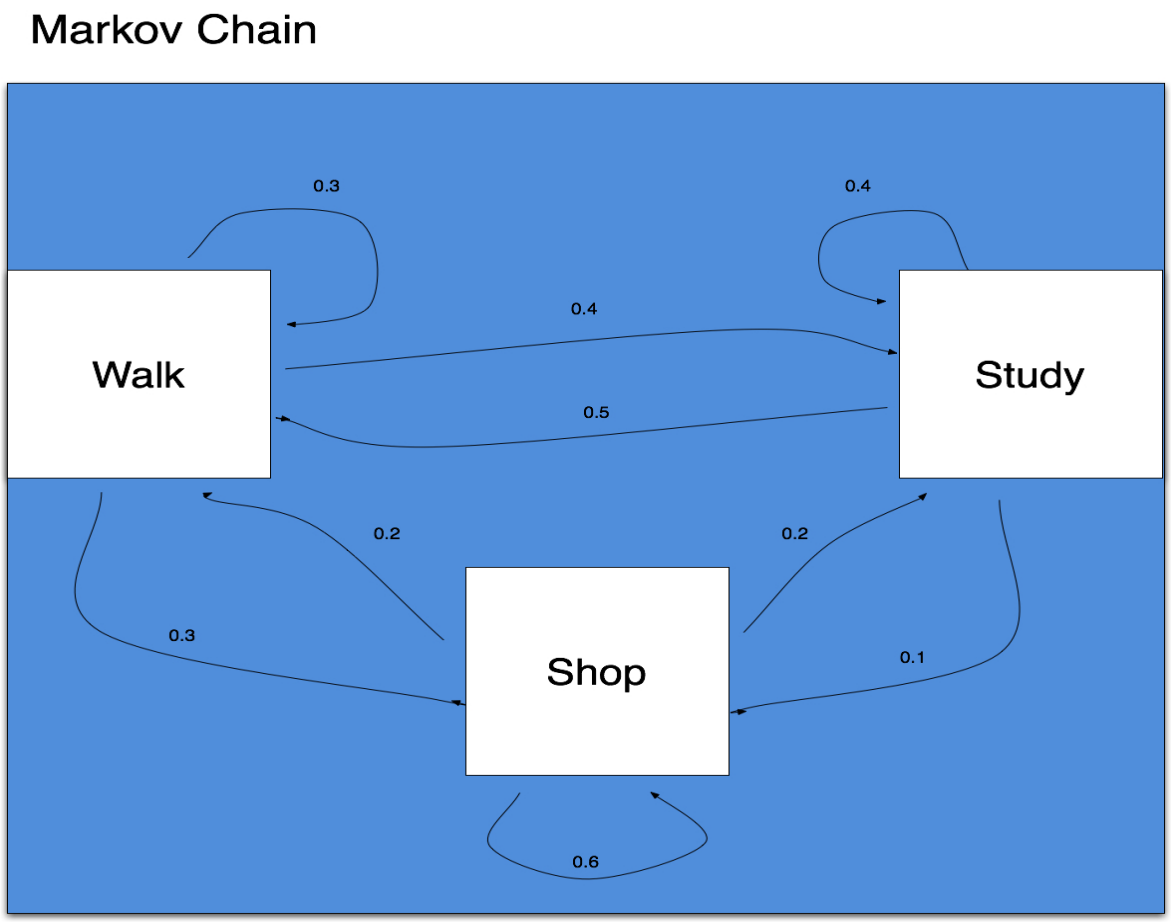


Figure 4.1 A simple Markov chain

4.3 Hidden Markov Model

In a hidden Markov Model the sequences of the observable output symbols of a Markov chain are visible, but their internal states and state transitions are not (Neirhaus, 2009). In fact, a Hidden Markov Model except its output layer, should has at least one hidden layer. Consider a Hidden Markov Model with one hidden layer, in this system states in output layer should be fully connected to states of the hidden layer, but they are not connected to

each other. And states in the hidden layer are, either fully connected to each others and to the states of output layer. Except the first trigger for beginning of the whole procedure, actually, there are two kinds of transition in this Hidden Markov Model. The first one occurs inside the hidden layer and between the states, and its outcome is completely determined by the wighted connections. The principle of this transition is very similar to the Markov chain. After this transition and when the state in hidden layer become clear, another transition from that state in hidden layer to a state in the output layer happens. The second transition is determined by wighted connection either.

In figure 4.2 you can see the same daily plan, for a person, but this time it depends on the weather, which is located in the hidden layer. For example, if today is rainy, there is only five percents of chance for him/her to go for a walk, and 15 percents for shopping, and for 80 percents he/she will study today, these are the second type of transition. The first type of transition, which occurs within the hidden layer, determines how the weather is going to be tomorrow, so if today is rainy, tomorrow will be rainy for 90 percents, and there are only 10 percents chance to have a sunny day.

4.4 Hidden Markov Model in Cells

HMM generates pitches, rhythms and intensities in my Cells. Of course the input of the cells is an ON message and its outputs are three lists of values of pitches, durations and intensities. The length of the output list is determined by the duration of the original melodies. I divided the total durations of the melodies into the smallest time unit of Iranian classical music which is a sixteenth note. So for example if total duration of an original melody equals a dotted quarter note, the output layer of that Cell would have six positions

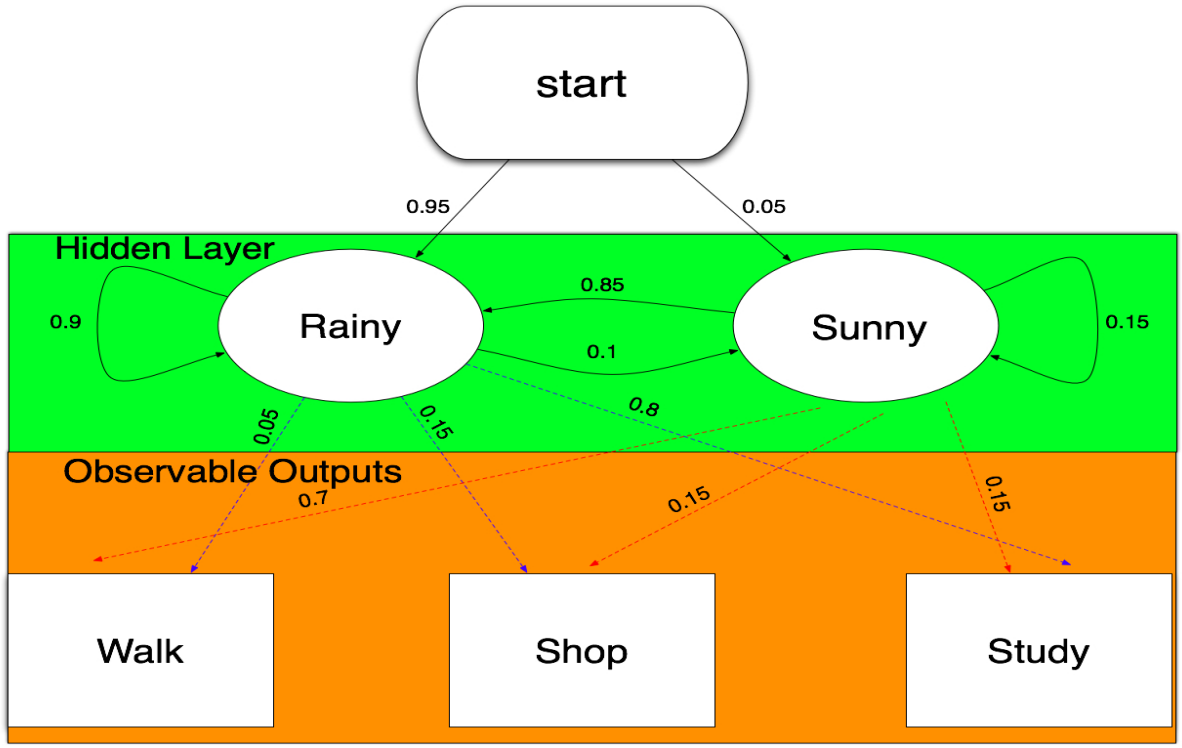


Figure 4.2 A simple Hidden Markov Model

and each position should have its own value for pitch, duration and intensity. Therefore, there are three types of HMM for each melody in each Cell, one for pitches, one for durations and one for intensities. Since they have a more or less similar structure, first I will depict the general structure of the algorithm and then I will talk about the difference between HMMs of pitch, duration and intensity.

General structure: In my cells, I designed a Hidden Markov Model with one hidden layer, figure 4.3. For the hidden layer, I defined five states, each of which stands for a level of correctness. The state number five is the most correct which is in fact the original melody of Daramd e aval e Shour, and the state number one is the wrongest or I can say the most random. All the connections between the state number one and output states are equally weighted. For example if I adjust the level of correctness to state number one and there are four states in output layer, all states have 25 percents chance of occurrence. And if I adjust it on the state number five only the original value of the original melody has 100 percents of

chance to be played, and weights of the other connections are set to zero. Going down from state number five, the probability of the occurrence of the farther values from the original one, are getting larger, and as I said, the probabilities become equal at the last state.

Pitch list determination: As I explained [Chapter three, p. 21-25], pitch in Iranian music is derived from the modes and modes are constructed based on some specific relationships between tetrachords and pentachords, and finally tetrachords and pentachords are made by some specific rules. So if some one wants to improvise within the traditions of Iranian classical music and on a specific part of Radif, he/she should know, maybe by his/her heart, the mode of that part, and consequently its tetrachord and pentachord. For instance, when he/she wants to play a new tone, depends on the previous tone in the mode, for each tone, except the tone itself, he/she has three other options if the previous tone located in the tetrachord, and four options if it belongs to the pentachord of the mode. Because otherwise he/she will jump out of the specific range of the tetrachord or pentachord, and consequently the mode will be changed, and by the point of view of Montazamieh this jump is very wrong. This is the reason for scarce occurrence of a melodic jump larger than a perfect fifth in Iranian music. Of course, there are lots of rules and behaviors for going from a tetrachord to a pentachord, and also, there are more complex rules for moving from a mode to another. But since here I want to talk about the main principles of my idea, and on the other hand, this piece is based on a specific part of Radif with one specific mode, such discussions are quite out of discourse here.

Figure 4.3 depicts a HMM in a Cell for determination of pitch. The hidden layer, consists of five states of correctness. Consider the original pitch is G. As you can see the state number five only can send an ON message to the second state in output layer. As the correctness is getting lower, the chance for firing a G is getting smaller and smaller. And all

the possible outputs have equal chance of occurrence in state number one.

Duration determination: oppose to the pitch determination part which each position has one HMM, for duration each note of original melody has one HMM. For instance, if the melody consists of one dotted quarter note and one eighth note, consequently the cell has two HMMs for determining the durations. Which means each HMM determines duration for a couple of positions in output layer. The output of the HMM is a list of On and Off messages for the positions. An Off message is in fact a zero value which is multiplied by the envelope of sound object. So for example if the original melody is a dotted quarter note and an eighth note, and

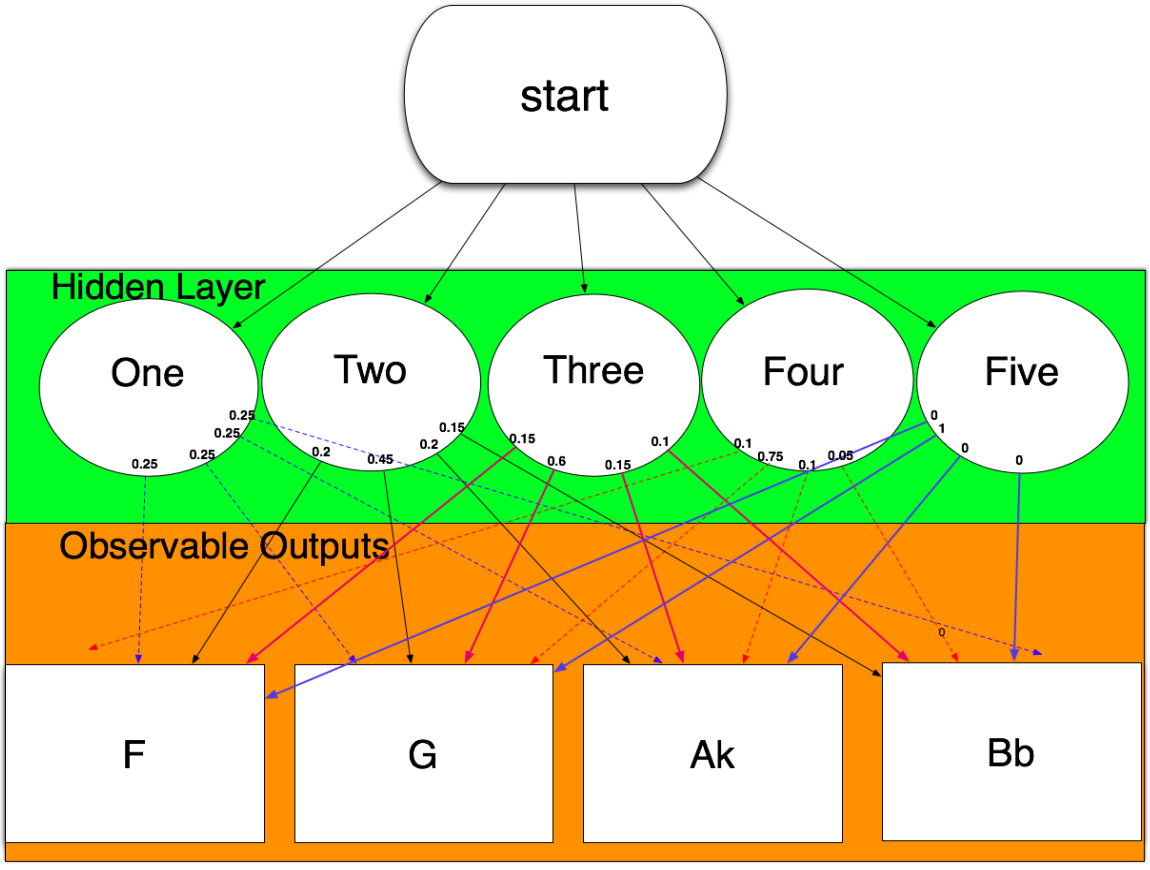


Figure 4.3 Implementation of Hidden Markov Model for pitch determination in Cells

the correctness status is adjusted on number five, the output list is the list of On and Off messages in table 4.4, which is resulted from two HMMs, one for the dotted quarter note and one for the eighth note. For this piece, I used a sound sample from Santour, which is a

hammered instrument, as my sound object. And do not forget that the duration of each position is a sixteenth note. Therefore, in case of table 4.4 at the beginning the Cell plays the sound sample one time, then it does not play anything for five positions, and then at position number seven it plays the sound sample again, and it does not play anything for position number eight.

X						X	

X = On message Blank = Off message

Table 4.4 List of On and Off messages for a dotted quarter note and an eighth note

In fact Pitch HMM of Cell fills all the positions of output list, but Duration HMM of Cell does not play all of them, table 4.5.

G	G	F	Bb	Ak	Ak	G	G
X						X	

Table 4.5 Output lists of Pitch and duration HMMs of a cell

Another difference between duration HMM and pitch HMM in the Cells, is the fact that the duration HMMs are actually integration of two HMMs[2]. One for specifying the probability values of On and Off messages in different correctness statuses, and one for assigning the values of probability for number of On messages in output lists. Let me explain it with an example. Figure 4.6[3] shows a duration HMM for a dotted quarter note. If we set the correctness status on number five, which is the smallest circle, the first position for 100 percents receives an On message and other positions do not have any chance to get an On message. If we change the status to number four, first position has 75 percents of chance to get an On message and 25 percents to receive an Off message. And simultaneously the fourth position has 10 percents of chance to get an On message and consequently for 90 percents it would get an Off message. As you can see in the largest circle, which is the state number one,

2 Do not mistake it with a HMM with two hidden layers.
3 Due to the large amount of cords, I draw the algorithm in an imaginary circular way.

all positions have equal chance to receive an On or Off message.

The reason of using two HMMs is quite clear. Because if I used only one HMM, the number of notes in output list was always equal to the number of notes of original melody. In this case most of the final melodies are wrong, because Cells instead of improvising just change the positions of notes in a quite meaningless way. And moreover, in an overall view the performance of integrated HMMs is very similar to the real Iranian improvisations; Iranian improvisors mostly substitute the original notes of melodies of Radif with ornaments and new smaller notes. Figure 4.7 shows four different output lists for a dotted quarter note in different statuses.

The plan of probabilities is designed based on the subject that I explained in second chapter under the title of rhythmic contrast in Iranian classical music [Chapter three, p.42]. As you can see in the figure 4.6 the distribution of probabilities in different statuses does not let the Cell to make sharp illigal rhythmic contrasts, rather it tries to substitute the dotted quarter note with two dotted eighth notes, and so on.

Intensity determination: The structure of the Intensity HMM in the Cells is very similar to the structure of Pitch HMMs. The only difference is the fact that the states of observable layer are four intensity values. These values are multiplied by the envelop of sound object. As I explained before [Chapter three, p. 43], due to the soft intensity contrast in Iranian music, the states of output layer are 1, 0.8, 0.6 and 0.4. Obviously, attack position of notes in original melodies tend to have larger intensity values in output list.

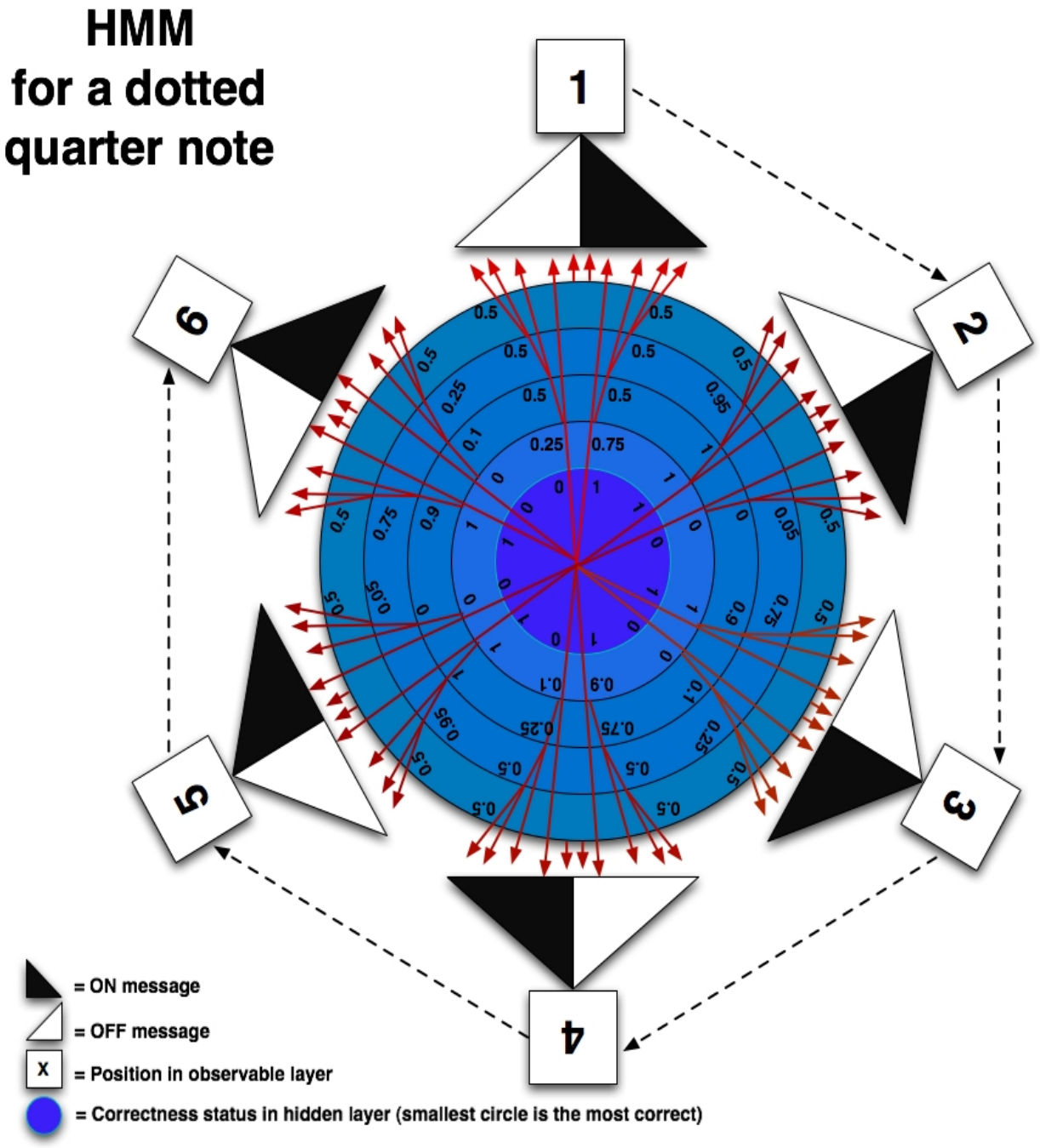


Figure 4.6 A Duration HMM of a Cell for a dotted quarter note

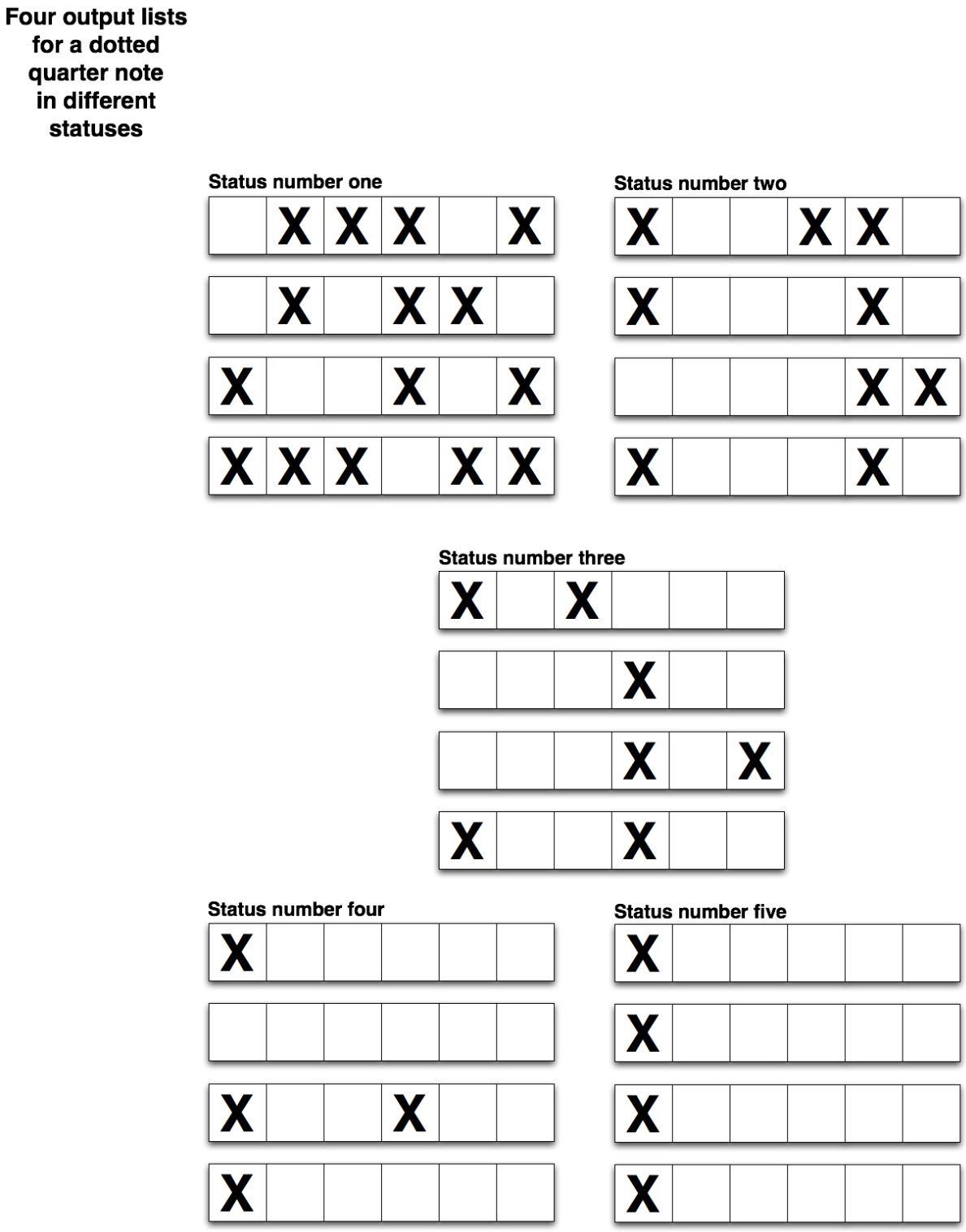


Figure 4.7 Four output lists for a dotted quarter note in different correctness statuses.

Table 4.8 shows an example of the final outcome of the Cells, which is in fact a melody, or I can say an improvisation based on a specific melody.

	1	2	3	4	5	6	7	8	9	10	11	12
P	Ak	Ak	Ak	C	C	Bf	Bf	Bf	Ak	Ak	G	G
D	X	X		X			X		X		X	
I	1	0.8	0.8	1	1	0.6	0.8	0.4	1	0.8	1	0.6

K= Quarter tone lower f= Fat X=Om message P=Pitch D=Duration I=Intensity

Table 4.8 Example of final output of Cell

Most of the generative algorithms have a training procedure. In this procedure another algorithm tries to adjust the value of probabilities of network, by categorizing the outputs of network as correct, wrong, very wrong and so on. Although, the designation of Cells was based on my compositional idea, and musical style modeling objectives are quite irrelevant in this context, still this matter does not eliminate the whole functionality of such a training procedure. Because, although, the improvisations of the Cells could be valid to some extent, categorizing all output lists based on the correctness status could not sufficiently validate all outputs. For example, since even in a pure randomness there is a tiny probability to get a valid and, probably, a creative answer, therefore it is not correct to treat all outputs of the state number one as wrong outputs. Moreover, in context of classical musics, different tones of a melody have different values of importance. Thus, it may be possible to change some of them freely, but for some others even a tiny alteration could invalidate whole the melody.

Therefore, there should be another unit to check the outputs validity. Normally, a Neural Network does the training procedure. But since I needed to control some aspects of this procedure and Neural Networks hardly allow such a further controlling, I used one of the predecessors of Neural Network, McCulloch-Pitts cells.

4.5 McCulloch-Pitts Network and Cell

McCulloch-Pitts is a system which is consists of a network and some cells. In the network, the edges only transmit zero or one. The network is composed of directed *unweighted edges* of *excitatory* and *inhibitory* type.

McCulloch-Pitts units or cells have three characteristics:

1. Get n excitatory (Xn) and m inhibitory (Ym) inputs through its edges.
2. If m>=1 and at least one the signals Y1,Y2,...,Ym is 1, the unit is inhibited and the result is Zero.
3. Otherwise the total excitation X=X1+X2+...+Xn is computed and compared with a predetermined threshold (T) of the unit. If X>=T the unit fires a 1, if X<T the result is 0. (Rojas, 1996, p. 32)

Actually, the interesting point of this system, was the wonderful application of *threshold Logic,* and how with a few simple calculations it can evaluate and test the validity of its inputs in terms of a verity of boolean functions.

Here, I am trying to depict how do they work by explaining two simple examples in figure 4.9. As you can see in the figure, there are two units and each of which has three inlets and one outlet. Consider the objective is to make two cells, which first one should be able to distinguish an AND function, and second one should be able to distinguish an OR function, through their inputs. Left half of the cell is in charge of summation, and the right half compares the summation result with a predefined threshold value. If adjust the threshold value as same as the number of inlets, which in this case is three. The cell outputs a one, when it gets three one through its inlets, and otherwise the output is zero. By changing the threshold to one the function of the unit will be altered to an OR function, for if at least one of the inputs is one, the cell fire a one, and it will output a zero just when all inputs are zero.

So, as you can see small changes in threshold, could result in a vast verity of functions.

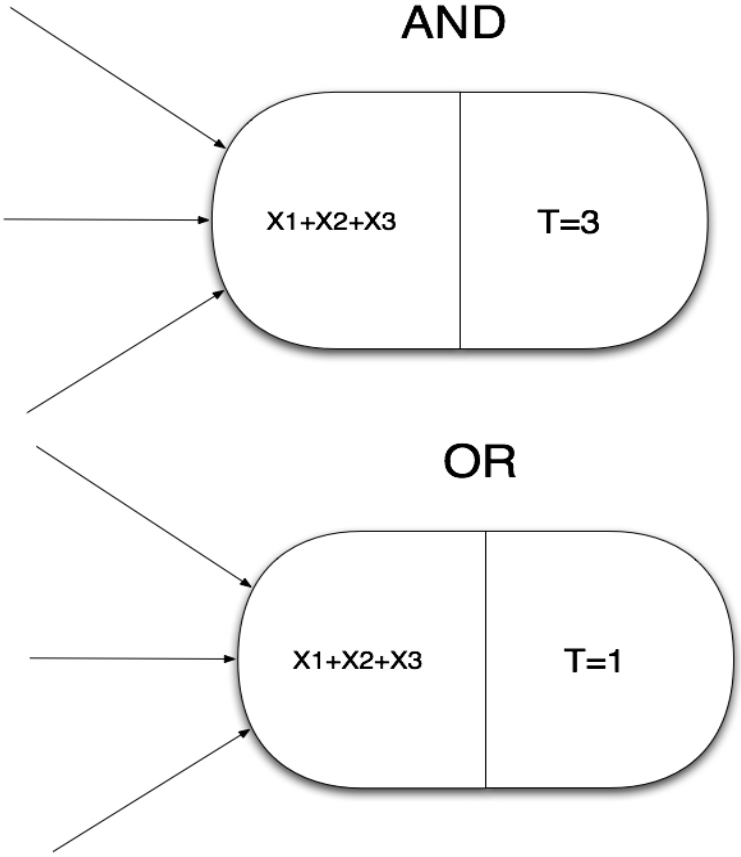


Figure 4.9 Threshold logic in a McCulloch-Pitts unit (Rojas, 1996, p. 34)

4.6 Implementation of McClloch-Pitts Units in Cells

By manipulating these two features, threshold logic and excitatory and inhibitory inputs, I tried to solve the validity problem of outputs. In order to the optimizing the Cells outputs, based on the original piece of melody, I made three reference list for all Cells, one for pitch, one for duration and one for intensity. The Cells compare their inputs which are the outputs of the HMMs, to the reference lists. If the lists members were equal, it fires a one for that position, other wise outputs a zero. As I said before, some of these tones are more important than others. These tones are actually my inhibitory edges. That means, the comparison results for these positions should be one, otherwise the generated list would be

tagged as invalid. These inhibitory values go to another unit. The unit sums them and compares the result to a threshold value which is adjusted to do an AND function. Thus the unite outputs a one, only when all the inputs are one. Firing a 1 by the unite, transmits an ON message to another unit which compares all the positions of the new list with its reference, and sums all the values of all positions. And then compares the summation, to another threshold value. Adjusting this threshold value as same as the former unite threshold value, the lists just pass the minimum qualification. If set it to a value which is equal to the number of positions, only the original list can pass the qualification. So by increasing the value of threshold, one can go from an OR function to an AND function, which could means moving from being innovative to conservative, and mean while being quite sure about the validity of new melodies and improvisations.

Graph 4.10 depicts an imaginary situation of this procedure which evaluates the pitch validity of a list. As you can see, the fourth value of the new list is different from the original list. The important positions, inhibitors, are first, second and fifth positions and as you see their comparison results are connected to the both units at the bottom. The left one is in charge of the AND function and the right one does the OR function. Since all the inputs for the And function equal one so it fires an ON message to the other unit. The OR unit threshold value could be changed between three, which is the minimum qualification, and six which only the original list could pass it. So, by shifting these two threshold values, it is possible to change the quality of improvisation from being modest to being innovative.

As you have seen till now, the Cells can improvise based on Iranian music. It is possible to change the quality of their performance between being very conservative but correct and innovative but random, by changing the correctness status of Cells. And it is possible to change the statuses in different aspects of improvisation. For example it is possible to have a

very correct and conservative pitches while the durations are very random. And it is also possible to check the validity of improvisations by different standards, by shifting a threshold value. Having the final output as a list, give this possibility to the user to play them in different ways. For example consider three random walk generators and each with a different step size are adjusting the correctness statuses, and each cell plays the final list twenty times faster than the original duration of its assigned piece of melody, and there are 60 of these Cells. The output of this setting, in my opinion, transforms the leaner melodic structure of that part of Radif into a texture or an atmosphere. This means, although, this sonic texture sounds very different from the original melody and it sounds more like a dense noise, it still associates to its original piece of melody. Because even very small components of it, follow the general rules of Iranian improvisation. And all of the tiny tones have a more or less plausible but not fix relationship with each others. However, this sonic texture is not my final objective.

As I explained in the main assumption of this piece at the beginning of this part, my idea was to make an artificial Iranian improvisor by an algorithmic approach, and then by another algorithm interfere the principles of the improvisation of the former system. The Cells are in fact the artificial improvisors. So I still needed to design an algorithm to damage the Cells. I knew that I do not want damage the final outputs of the Cells, rather the interfering procedure should damage the internal principles of the Cells. In other word, my purpose was not to destroy the Cells by an alien elements, rather I wanted to make Cells destroy themselves, by themselves. I had tried different ways, but finally I found out the procedure of getting cancer is very close to my idea.

Cancer cells have four main characteristics:

1. Cancer cells do not stop reproducing.

2. Cancer cells do not obey the signal from the other cells.
3. Cancer cells do not stick to gather.
4. Cancer cells do not specialize, but stay immature. (“Cancer Research UK”, n.d.)

Cancer cells are not caused by an alien element. All normal cells have a small chance to turn to a cancer cell. However, some behaviors could increase the amount of chance. A cancer cell forgets how to die, so it starts to reproduce itself for infinity. In this situation the other cells send a signal to the damaged cell and ask it to kill itself, but a cancer cell does not obey the signals. Oppose to the normal cells which have a very specific position and place, cancer cell does not stick to the other cells, and freely moves to anywhere it wants. Each time a normal cell reproduces itself, it should exactly reproduce its gene, but cancer cell does not reproduce all the genetic informations that it has in its own gene and consequently it becomes more immature. As you can see the cancer procedure is quite similar to my idea for damaging the cells. So, I tried to make the same procedure in the Cells and I call it *Canceration*.

Now consider the tones of artificial improvisation as normal cells. Each tone like a normal cell has a specific position and place . In each new improvisation, the algorithm reproduces a new tone for each position which is similar to the reproduction of a normal cell. Although, each tone has its own duration, pitch and intensity, all of them use a same buffer, which is filled by my sound object. And this matter is very similar to the exact reproduction of genetic informations in normal cells. Inspired by the cancer cells, I designed the Canceration procedure in the Cells. Therefore, all the Cells have a tiny chance, mostly less than a percent to get cancer. As cells are running more and getting older the chance of getting cancer is increasing. Once it happens, it starts to grow and grow and finally damage the whole cell. It does not have any connection with other parts of cell, so it never obeys the rules of Cells. It uses the same buffer as the Cell does, but it processes and plays an arbitrary part

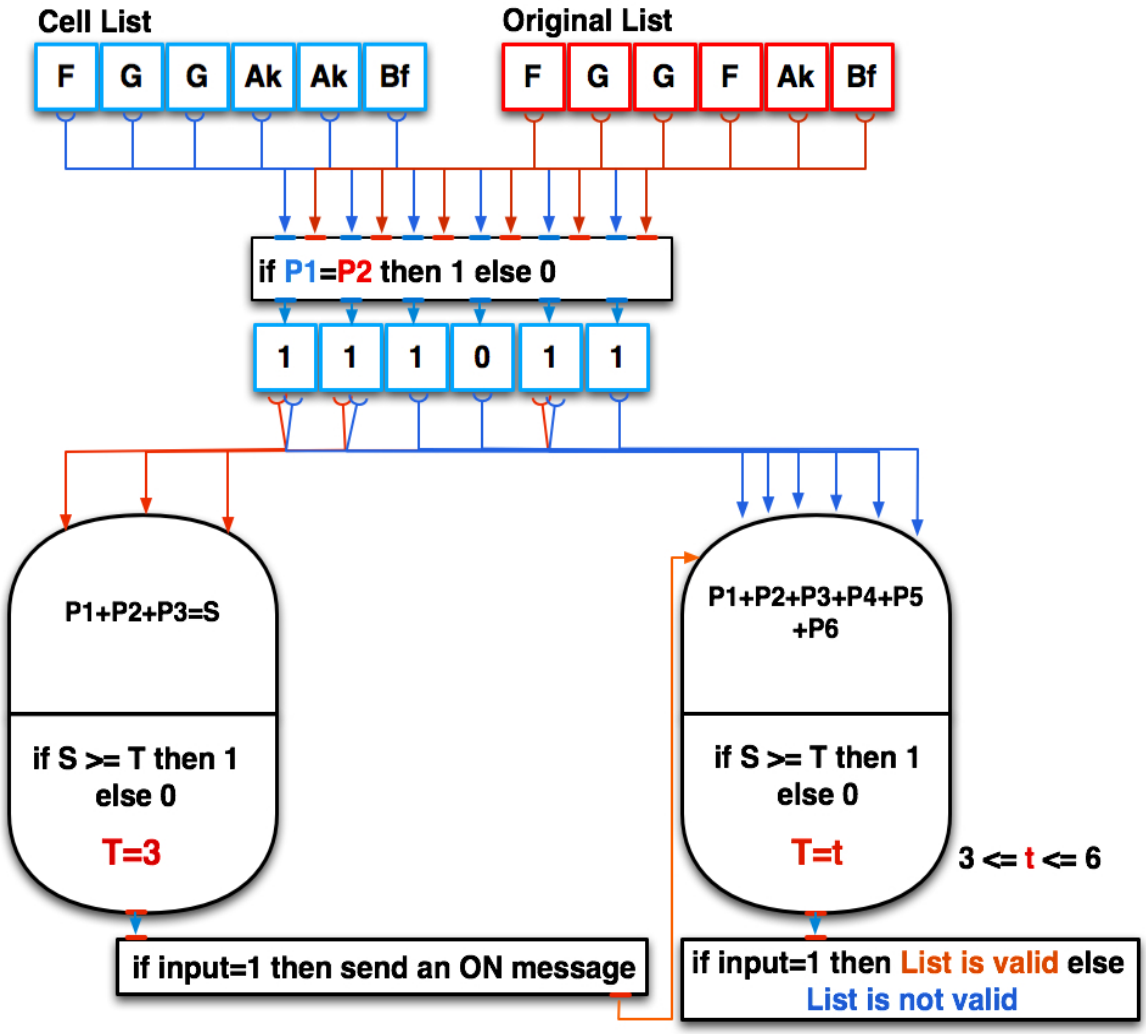
of it in a very random way with a random duration and intensity, and then randomly puts its output exactly between the healthy tones. All of the cancer outputs are exactly reproduced in each improvisation. Therefore, Canceration is like a tiny jitter at the beginning, but as it is growing more and more, it is getting larger. Cancer unit first tries to put these jitters between all the tones. And after all the healthy tones get fully surrounded by the cancer tones, the jitters start to become more significant. If you give enough time to Canceration, let say 30 minutes, the result is a very long noisy sound, and you can hardly distinguish the tiny healthy tones among them. All in all, Canceration is a growing procedure and it tries to damage whole the connections, relations and logics between the different tones and does not respond to anything but itself.

I think by now I could give a quite clear image of my compositional idea, which was moving through the borders of concepts such as being correct, innovative, conservative, damaged and modest. Oppose to the Western culture, which even the most of very innovative styles try to make their own dogmas and consequently draw a quite clear border between themselves and others, in Iranian music due to its strong improvisational roots, these borders are very unclear and vague. In this piece my objective was to show these borders. Obviously, I did not try to find a specified line for these borders and I am pretty sure there is not such a thing at all, rather I tried to derive, consciously, my materials out of this grey and ambiguous area between these concepts. And instead of showing the borders, by multiple jumps over the borders and walking in the gray and ambiguous edge of these concepts, I tried to show the different atmospheres. So consequently instead of showing the borders I tried to feel them.

4.7 Composition is not Just Science

Unfortunately or fortunately, this part has a sad but instructive ending. I do believe

that complexity is a very important part of composition, art and, let me say, any kind of creative actions. This approach, I mean the idea of making an artificial Iranian improvisor, was completely wrong. At least in my case it was very wrong. Because the main reason for making these cells, was to design some cells or algorithms that can perform patterns which are more complex than the Iranian music itself. But the outputs of cells are, eventually, more simple than Iranian music, and let say they just pretend to be complex. I do not criticize the piece, I mean Rainbow in Azidahaka`s eyes, because I tried to compensate the lack of



P=Parameter S= Summation T=Threshold

Figure 4.10 Implementation of threshold logic in Cells

complexity in the piece by editing and some other stuffs, and I am quite happy with the final result. Rather, I want to say the wrong matter with this approach is, its upside down nature. Normally, one should try to make the most complex thing by the most simple possible way. But here I made a quite large and complex tool which generates very simple improvisations on Iranian music. In fact, I consumed large amount of time to make a tool which is capable of doing something that I can do it in a tiny moment by myself, and even better than these cells.

More over, my idea was to make these cells and then by modulating their principle get some interesting results which are still carrying their Iranian quality. But, actually, in these kind of networks, such as Neural Network and HMM, you do not have such a control over them. Because their main element is their wighted connections, and it is not possible to change the weights that much. Because when you change them the result is not very different from a complete random procedure. Therefore, their behavior always fluctuating between being very conservative and being very random. Thus, I think these tools are not suitable for compositional ideas like mine. And as a conclusion I want to say: The composition is not a science, rather it is an Artscience.

4.8 A Short Comment on the Title

In Persian mythology **Aži Dahāka** is a king who let Ahriman, Persian word for Satan, to kiss his shoulders. At once, two black snakes grew out of his shoulders. Snakes which he had to live with them for the rest of his life and they had to be fed by brains of young boys.

4.9 “Adieu DNA” Keykhosro Said

As I talked about in chapter one, one of the main objectives of this research is to find

the fundamental hidden roots and concepts of Iranian music and culture, which exist in deep layers of Iranians` unconscious. I do believe if we find and understand them and bring them to the contemporary situation of our life, it will answer many of our questions. And moreover, since one of the most, or maybe the most, important features of our contemporary life is being fragmented, and also as I said before, a true piece of art or music should be constructed on a true perception of the situation which it is coming from, so maybe a true subject for a piece of art or music, should talk about this *being fragmented* issue. Of course, I do not want to define a codified style of music, rather I believe there are infinite ways to reach this goal, and anyone should define his/her own way. In this part I want to talk about my own way of approaching to this idea.

At the beginning of the second year of my master program, I was strongly looking for the definition of self, in Iranian and Sufism attitude. And I found a statement by a Persian Sufi Bayazid Bastami (804-874), which ignited the first idea of the piece in my mind. Before talking about the statement itself, it worth to shortly talk about an issue in Sufism. Along all the features of Sufism that I have talked about in chapter two, there is an important and confusing matter, which exists in all features and aspects of sufism, a paradoxical duality. A duality between all and nothing. A sufi knows everything but at the same time does not know any thing. A sufi is God and simultaneously nothing. The main reason for such an attitude is coming from their perception of world and being as a unified body. For more understanding lets read the statement:

> […] I contemplated my I by means of His own ipseity, and I saw him. My light faded under His light, my strength vanished under His strength, my power under His power. Thus I saw my I through His Self. The greatness that I attributed to myself was in reality His greatness; my progression was His progression. After that, I

> contemplated Him with the eye of Truth and I said to Him: Who is He? He answered me: Neither myself nor other than myself. (Corbin, 1993, p. 193)

The first time that I read these sentences. I felt lots of triggers in myself. Something familiar. It was like someone shouting from very deep layers of my unconscious. I was heavily touched by it. I knew that the attraction of the sentences is not because I believe in such an attitude, rather it is a very unconscious kind of attraction. Then I tried to understand it in my present life. Therefore, I tried to interpret it to the language and situation of my own life and see what is going to happen.The result was this sentence:

> I contemplated my I by means of a self creator apparatus ipseity, and I saw Oh Daesu[4], Diego Maradona, a missile, the guy who advertises Ovchipkard, Lucio Fontana[5], Azidahaka[6], my friends, KLM, Randy March[7], Edgar Varese[8], Mr.Hyde[9], Oral-B, My cellphone and tax number, News program, the man who burned himself in Tarkovsky`s *Nostalgia*[10] and many many other things. My light faded under Their lights, my strength vanished under Their strength, my power under Their power. Thus I saw my I, through Their Selves. The greatness that I attributed to myself was in reality Their greatness; my progression was Their progression. After that, I contemplated Them with the eye of Truth and I said to them: Who are Them? They answered me: Neither myself nor other than myself.

4 Main character of *Oldboy*, a korean movie by Chan-wook Park.
5 An Italian painter, sculptor and theorist.
6 A mythical character in Persian mythology.
7 fictional characters in the animated television series South Park.
8 A French-born composer
9 One of the main characters of *Strange case of Dr.Jekyll and Mr.Hyde*, a novella written by Robert Louis Stevenson
10 A movie directed by Andrei Tarkovsky.

I found them and many others in myself, and I saw how separately they live in me. By separate I mean they do not mix to each other, rather they all have their own separate life. This is the main Idea of the piece, parallel fragmented identities.

4.10 Imaginary Performance

As I said before, concert is an align phenomenon in Iran [Chapter two, p. 12]. It is like a century that Iranian musicians present their pieces in concerts. Before that Iranian music had been belonged to a very elite and special group of people (During, 2003). They performed music in small gatherings. The setting of these gatherings were quite different from a Western performance. In such a setting the musicians do not have a stage. Musicians and audience sit beside each other. It could be even possible, to have more than one or two musician/s, in this case different musicians play their music right after each other, and they even can accompany each others (During, 2003). Therefore, during a gathering the roles of being musician and audience could be changed for couple of times.

Now consider one of these gatherings, in an imaginary place, which all the people, musicians and audience, are one person, me. Those different identities gathered to play a music, or better to say to sing a chant, with each other. This is the idea for composing this piece, I mean using voice as the only sound material. Now let see how I want to use this different concepts and ideas in the piece.

4.11 Main Elements

The piece has six main elements which are text, modes, voice and its scores, spacialization scores, time scores and finally sound transformation.And In the following

pages I will talk about them.

4.12 Text and Syllables

As I said, the only sound material of this piece is voice. All the vocal materials are different syllables of Persian words. The syllables are derived from four poems, from for different eras and obviously by four different poets, Abu Said Abol-Kheir (967-1049), Rumi (1207-1273), Nima Youshij (1896- 1960) and Ahmad Shamlou (1925-2000). In Persian language there is a technique to convert a poem to music note, in terms of their duration. Iranian musicians for composing vocal pieces used to employ this technique. Recently, Arshad Tahmasbi (Tahmasbi, 2001), by manipulating this technique, invented a way to convert normal words, I mean not just poems, in to the music notes. And it is very important because by this technique, it would be possible to figure out the syllables` duration even in the case of more contemporary poems which do not follow the classical rhythmic way of poetry. Based on his new technique, I made a score for all poems. Figure 4.11 shows one of this conversions. On the left you can see the original poem by Nima Youshij, and its attributed notes on the right. Determining the time units, I made a table of syllables for each poem. Table 4.12 shows the syllable table of Rumi`s poem.

By these tables the syllables lose their semantic function and consequently, they let me to treat them as materials which, although, still strongly carry their lingual characteristic as a sonic material, they are completely meaningless. And as you can see the syllables are categorized in to four categories, quarter note, dotted eighth note, eight note and sixteenth note. These are the four possible durations of a syllable in Persian language, if assume the shortest syllable equals to a sixteenth note.

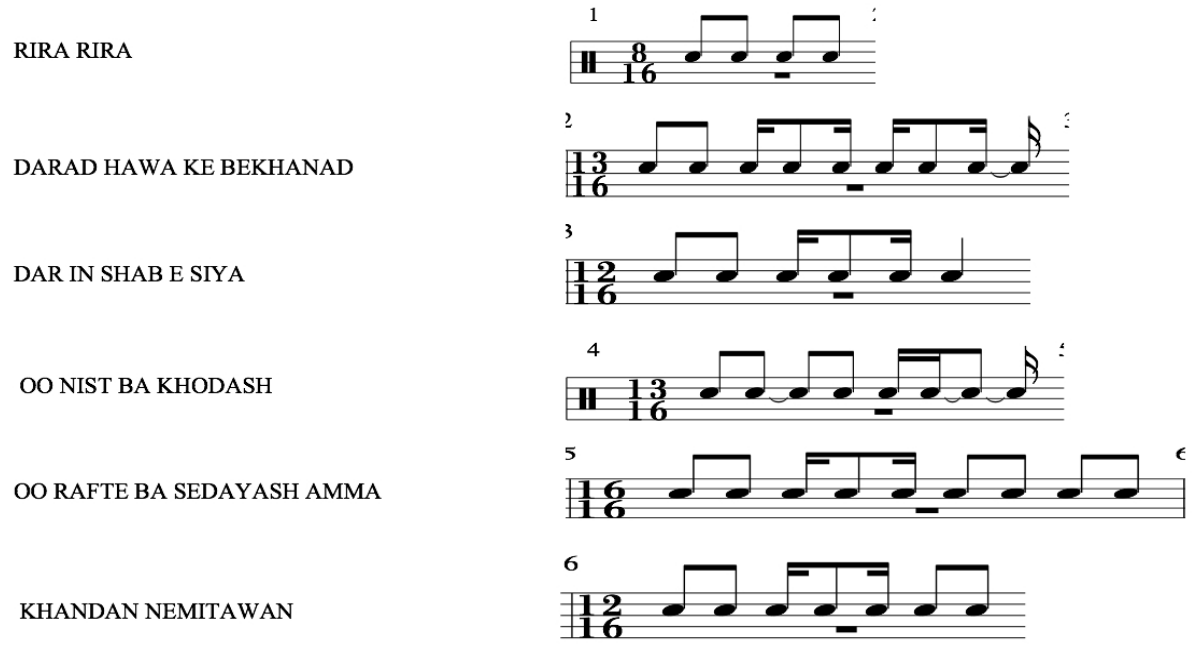


Figure 4.11 Time unit score for *Rira* by Nima Youshij

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Q																		
DE	ASL	SHID	PORS															
E	GAR	JA	A	SHE GH	DAM	NAD	A	TASH	RIN	A	LAM	NAD	WIN	A	ME,	BI	RA	CHO N
S	NE	ZA	DA	ZA	LA	RE	ZA	KA	RE	NE	DA	RA	KE	ZA				

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Q																		
DE																		
E	ZAR	HA	BAR	HAM	NAD	KHO R	OF	TAD	DAR	MI	AZ	NO	JA	A	MI	KAM	AZ	NA
S																		

	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Q																		
DE																		
E	MAH	MAN	AN	JA	MAH	RAM	KAM	NAD										
S																		

Q = Quarter note DE=Dotted Eighth note E=Eighth note S=Sixteenth note

Table 4.12 Table of syllables for Rumi

4.13 Modes

The last chapter of Jame Al-Alhan (Maraghi, 2009), which is like an advise to the young musicians, talks about four different natures of audience. In this chapter Maraghi suggests specific modes for each of them. Based on the character of poets and poems and also the characteristics that Maraqi talks about in this chapter, I chose 12 ancient modes, three for each poem. So, each character has its own tones, and singer can not sing any tone out of the specified modes for each character. Table 4.13 shows the modes.

Abol kheir	C	D	Ek	F	G	Ak	Bf	C
	C	Dk	Ek	F	Gf	Ak	Bf B	C
	C	D	Ek	F	G	Ak	Bf B	C
Rumi	C	Dk	Ef	F	Gf	Af	Bf	C
	C	Dk	Ek	F	Gf	Ak	Bf	C
	C	D	Ek	F	Gf	Ak	Bf	C
Nima	C	Dk	Ef	F	Gf	Af Ak	Bk	C
	C	Dk	Ek	F	Gf G	A	Bk	C
	C	Dk	Ek	F	Gf	Af	Bf	C
Shamlou	C	D	E	F	G	A	Bf	C
	C	D	Eb	F	G	A	Bf	C
	C	Df	Ef	F	Gfk	Af	Bf	C

K= Quarter tone lower f=Flat fk=Three quarter tones lower

Table 4.13 Three modes of each poem.

4.14 Voice, Syllables, Motions and Possible Scores

Regarding to issue that I explained in chapter three [p. 46], one of my main objectives in this piece is to eliminate the cause and effect, as much as possible. In a normal way in this piece there is a composer which is me and a singer, Janneke Van Der Putten. I should eliminate this relationship. It was quite clear for me that I should not ask her to sing a very specific thing. Rather, I should involve her in the concepts and ideas to make it possible for her to improvise in my desired context. Therefore, first of all, for quite long time I mean, as I

can remember, for seven pretty long sessions, we just talked about the main ideas of the piece, poems, and their meaning, concepts, poets and the hidden layers of both poems and the piece. During this process, I asked her to make a character, I mean a musical or I can say an expressional character for each poem. It was like an struggle to answer the questions like, “What is the best way to read them?”, “How should act when you are reading them?”, “How do you feel about them?”, “What is the best way to express them?”, “If you want to express the whole poem with just one of the syllables, which one are you going to choose?”, “How you will treat that syllable?” and many many other questions that I tried to find their answers in her way. The main reason for choosing a non-Persian vocalist was the fact that she can treat the syllables completely free from their meanings and as non-semantic materials. After making the characters, I asked her to make a motion based on each character. And we made the motions in the same way of talking and discussing the different aspects of the poems and music. In figure 4.14, I tried to show the motions. Obviously, the motions are not fix values, rather they just point to an overall movement.

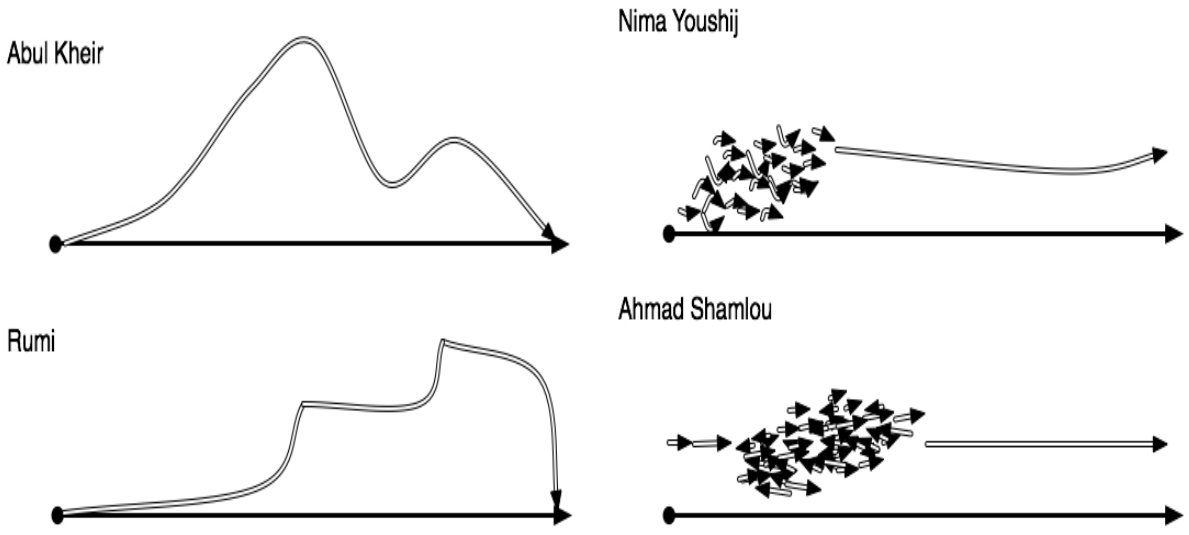


Figure 4.14 Four motions

This piece has seven parts or as I call them layers. And also it will be a quite long piece. Thus, it was not possible to compose the piece with just these motions. Obviously because it will be a large arbitrary mess. I found out for avoiding such a mess, I should make a score for each layer and poem. But composing a concrete score would be paradoxical to the the idea of elimination of cause and effect. In fact, the function of the motions is not to use them as a score, rather the motions are a way for reading the scores.

The main idea for composing the scores is derived from the idea of Possible score from Montazamieh school. As I explained in chapter three [p. 28], Iranian musicians had used a kind score which specifies the beats which should be, could be or should not be played, and I called it possible score. So, the idea is to make a possible score for singer, and singer should sing the score by mapping the motions to them, and then the result, I mean the recorded vocal material is itself another possible score for me. So the main idea for designing the scores was, to make some algorithms which are showing all possible legal actions and, also, allows the singer to use the motions for singing them.

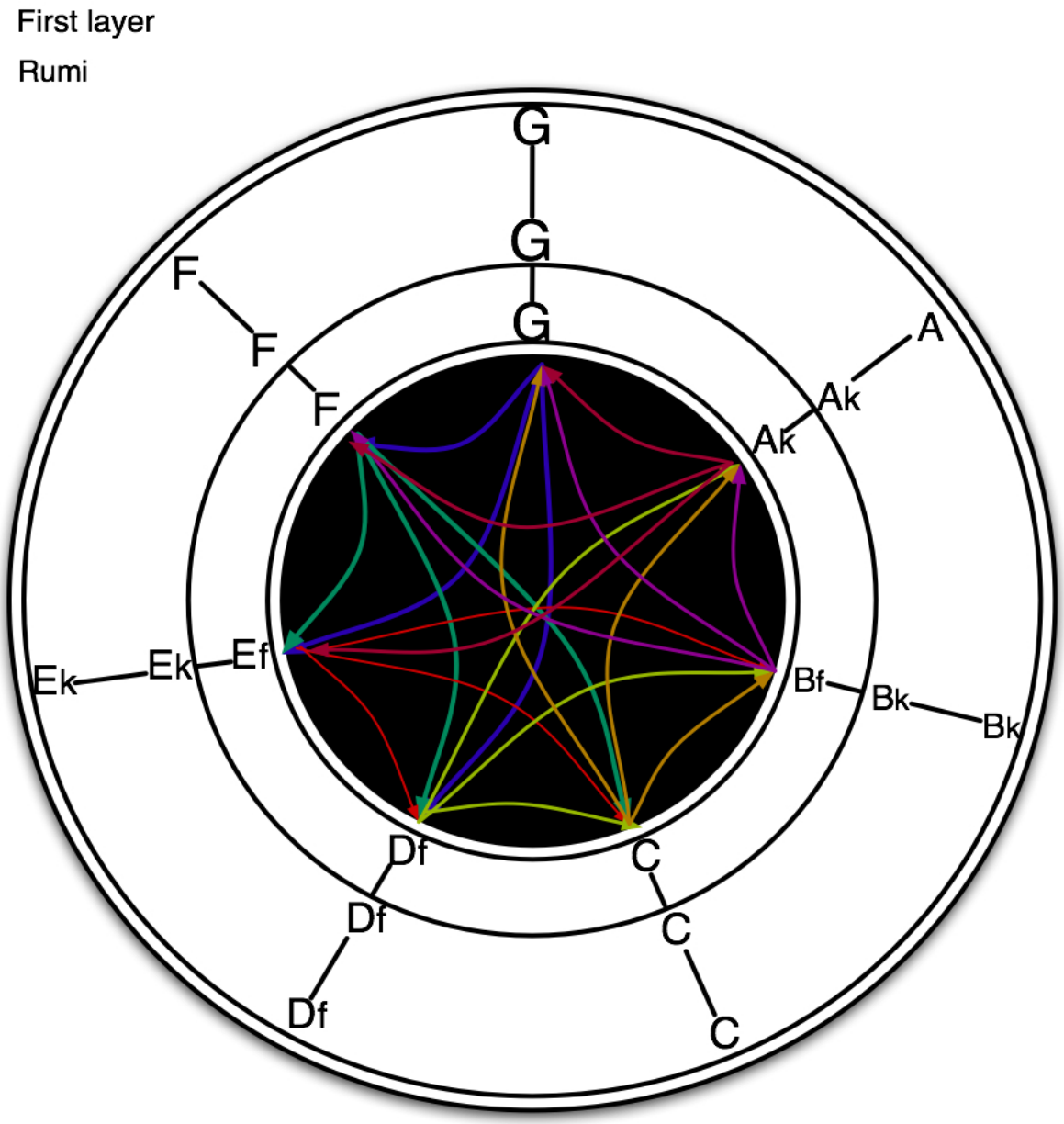
4.15 Possible Scores for Singer

Five of the seven layers of the piece have a possible score for singer. Here I want to talk about the vocal material of each layer and its score.

First layer: In Iranian classical music, there is a form, *Pishdaramad.* if I want to translate its name, I would say it means Preintro. Iranian musicians start their improvisations by one of them. It is a metric and slow piece (Safvat & Caron, 2009). In Pishdaramad improvisor tries to show what will happen during the improvisation. It is like the imagination of a mother about her baby during her pregnancy. Her imagination is not out of nowhere, rather she does it based on the personality, look and behaviors of the father and herself. But at the same time

it could be very wrong. So, the improvisor draw such an image for him/herself and the listeners at the beginning of the improvisation. The main idea for composition of the first layer is such an imagination. In fact, I want to show, in this piece we will listen, to a vocal music, the vocal materials are syllables, there are four different main sound sources in the four corner of the setting and each of them has an specific character and motion. And this piece is about Iranian music, and maybe Iranian culture, and it is a computer music, I mean there will be some sound modulations, distortions and etc. And besides all of them, it is an imagination of the piece. In this layer I decided to use the motions for figuring out pitch. Figure 4.15 shows the possible score of first layer for Rumi. Each circle shows one mode, and there are three circles. As I explained before in Iranian music a melodic jump never goes farther than a perfect fifth, even a perfect fifth is quite rare, and melodies are mostly moving up and down in a tetrachord. Therefore, it is possible to move from each degree to three other degrees or stay on the previous tone. The arrows let the singer to only move upward. For downward motions, the singer can not choose freely from the options, rather she should choose the degrees that she has used for the last upward motion. And if downward motion reach the first tone of the last upward motion, she can move down further freely and choose one of the three options. The arrows in the smallest circle are for all circles, so it is possible to move from any mode to other. Thus, after reaching to each degree, there are from 10 to 12 different options for next movement.

Second layer: The main objective of the second layer is expression. The singer should map the motions to the expression of pronouncing and singing the syllables, so there is not any kind of pattern for pitches and rhythms. The singer should just read the syllable and try to adjust her expression to the attributed motions, and it all happens in a very subjective way. The syllables are very short or I can say very normal, but during the layer, they are getting



k = A quarter tone lower f = Flat

Figure 4.15 Possible score of first layer for Rumi

longer and longer. The layer will be finished when the length of the syllables are approximately 11 seconds. At the beginning, when the length of the syllables are less than four seconds, the singer is completely free to choose any pitch or melodic pattern for each syllable, and she should only think about the expressions. Thus, she can freely use different tones, which she thinks is fitter to her expression. When the durations of the syllables are

between four and eight seconds, the singer should gradually start to choose some specific tones. For the durations which are larger than eight seconds, she should choose an specific tone from the specified modes.

Beside this, another objective of this layer is to move toward the borders of language, which in this context are, form, semantic and poetry. Consequently, the score of this layer has three parts, either. In the first part, there are different concatenations of syllables. The in common trait of all series is the point that none of them has any meaning, they are just groups of different syllables. So, the singer could randomly choose a group and sing it. In the the second part, there are different parts of the original poem. And for the third part I syntactically corrected the poems. As you know poets break the syntactic roles in sake of rhythms, rhymes and aesthetic. So, the sentences in the third part are out of poetry.

The singer, could stay in the first part as much as she wants, and if she moves to the second or third part, she should use just one of the combinations and then move to the first part again. It is not possible to move from the second part to the third part or vice versa. Figure 4.16 shows the score of second layer for Rira by Nima Youshij.

Third Layer: The goal of this part is to map the motions to the energy or I can say the amplitude of the tones. So, the steady tones, gradually start to show different motions in terms of their dynamic. But no change happens in their pitch. Figure 4.17 presents the score of third layer for Rira. A circle which has all the degrees of the three modes which are specified for each poem. This layer also has three parts. In the first part the durations should be approximately between seven and eleven seconds, and there are specified groups of syllables that the singer can choose one of them. During this layer the durations are getting shorter. In the second part of the layer, durations are between three and seven seconds. There is another group of syllables for this part, and singer should choose from them. In the third

Ri Be Oo Raaf Daan Ra Kha Nist Te Ne Ri Ba Mi Ra Dar Kho Se Ta

Da Yash Wa *Raad Naad Oo Am Ne* Haa In Khan Ri Kha Nist Te Ba

Be Ra Ri Dar Ra In Da Shaa Raad Si Wa Ya Haa Raf Ne Te Ne Oo Mi Daan

Oo Te Raf Nist Kha Ba Daar Naad Ba Be Sha In Dash Ya Oo Si

Daan Ba Taa Mi Te Se Wa Taa Da **Nad Yash Ma Am Khan** Be Nist Kha Oo

Nad In **Daar Ba Sha In Dash Be Kho** Raaf Oo Ba Nist Te

Ba Yash Kho Am Da Oo Khan Se Ma Raf *Ya Si Shaa In Dar Nad Kha Oo Dash Kho*

Wa Ta Nist Me Naad Ba Wa Daash Kho Oo Ba Te Ad Se Dash Ya Wa Si Haa

Ra Mi Wa Taa Daan Naad Ne Raad Ra **Oo Dash Ba** Kho Oo *Khan Am Da Ba Raf*

Ma Yaash Se Te **Aam Da Ba Raf** Yaash Se Te Raf Da Ba Raaf Naad Taa Ne

Wa Mi Daan Ke Raad Wa Da Ra Wa Raad Ra

Ha Si Ma Wa Ri Daan Te Nist Daar Ra Nad Ke Wa Ha Ta Rad Mi Da Daan

Khan Ma Am Yash da Se Ba Te Raaf Nad Wa Taa Wa Ke Sa Ne Ma Te Ba Be Ra Se

Ra Ri Wa Haa Ke Raad Da Yash Kha Raf Si Shaa Te Ba

Nad Wa Taa Mi Ne daan Khan Ma Yash Am Da Se Ba Te Raf Oo Dash Kho Ba Nist Oo Ya

Be Si **Wa Ke Ya Si Oo Dash Khan Ma Nad Wa** Da Kho Ba Te Ta Ra Ri Raad

Ya Shaa Si Be In Dar Naad Be Kha Oo Se Nist Kho Nist Dar Te

Nad Ri Wa Ra Taa Wa Mi Ha Ne Raad Dan Ke **Oo Yash Ba Nist Kha Dar**

Ba Yash Kha **Ra Ri Rad Ra Raf Ri** Kha Kho Khan Be Sha

Da Daar Daash Daan **Shaa Dash Be kho** Haa Be Ba

Nad Nist Ne In *Te In Ne Ke Wa Dash Nad Ri Daash Wa Ha Dan Oo Be Mi Shaa*

Be Sha Ya Yash Ke Raad Da **Dash Shaa Aam Mi in Nad Dar Ri**

Nist Taa Aam Oo Oo **Ba Ra Ne Be Oo Ke Te Da Ha**

Daan Te Oo Ya Am Dar Rad Nad

Figure 4.16 Score of second layer for Rira, meaningless group of syllables

part the durations are less than three seconds, and this part has its own group of syllables either. At the end of this part, the syllables should completely lose their long duration and become short syllables. The pitch, which is random at the beginning, gradually getting lower and lower. Therefore, at the end we have short syllables with quite low pitch.

The groups of syllables for each part of this layer are not chosen arbitrary, as you may noticed, all syllables in the first group start with a vowel and as you may know only the vowel could carry a tone. So, they have a specific and steady tone at their attack and body,but decay, which is a consonant, is quite noisy. For the syllables of the second part the vowel is in the middle and they start and end with consonant. So, the attacks and decays are noisy, and the body of sounds carry the tone. And finally in the third layer, syllables are started with a consonant and then shifted to a vowel. So, they have a noisy attack and the body would carry the tone. As I said at the end of this part the durations should become as short as I can say they do not have a body, rather, they are just short noisy attacks. Which is the characteristic of the short percussive sounds.

Fourth Layer: In the fourth layer, motions should be used for durations and rhythms. The main idea was to design a score which allows to map the motions to an improvisational system for rhythm. I knew if I stick too much to Radif the result would be very conservative and inflexible, which would be contradictory to the improvisational aspects of the piece. And on the other hand, using a very free system could result in a very random concatenation of syllables. Inspired by Montazamieh`s circles of rhythm and their expansion patterns [Chapter three, p. 27], I designed a score for improvisation of the syllables and their durations.

In this score, figure 4.18, all of the circles have an equal tempo. Consequently, the units in the smallest circle are the longest. Because, for example, in the duration of one unit of the smallest circle, it is possible to play six units of the fourth circle. The other aspect of

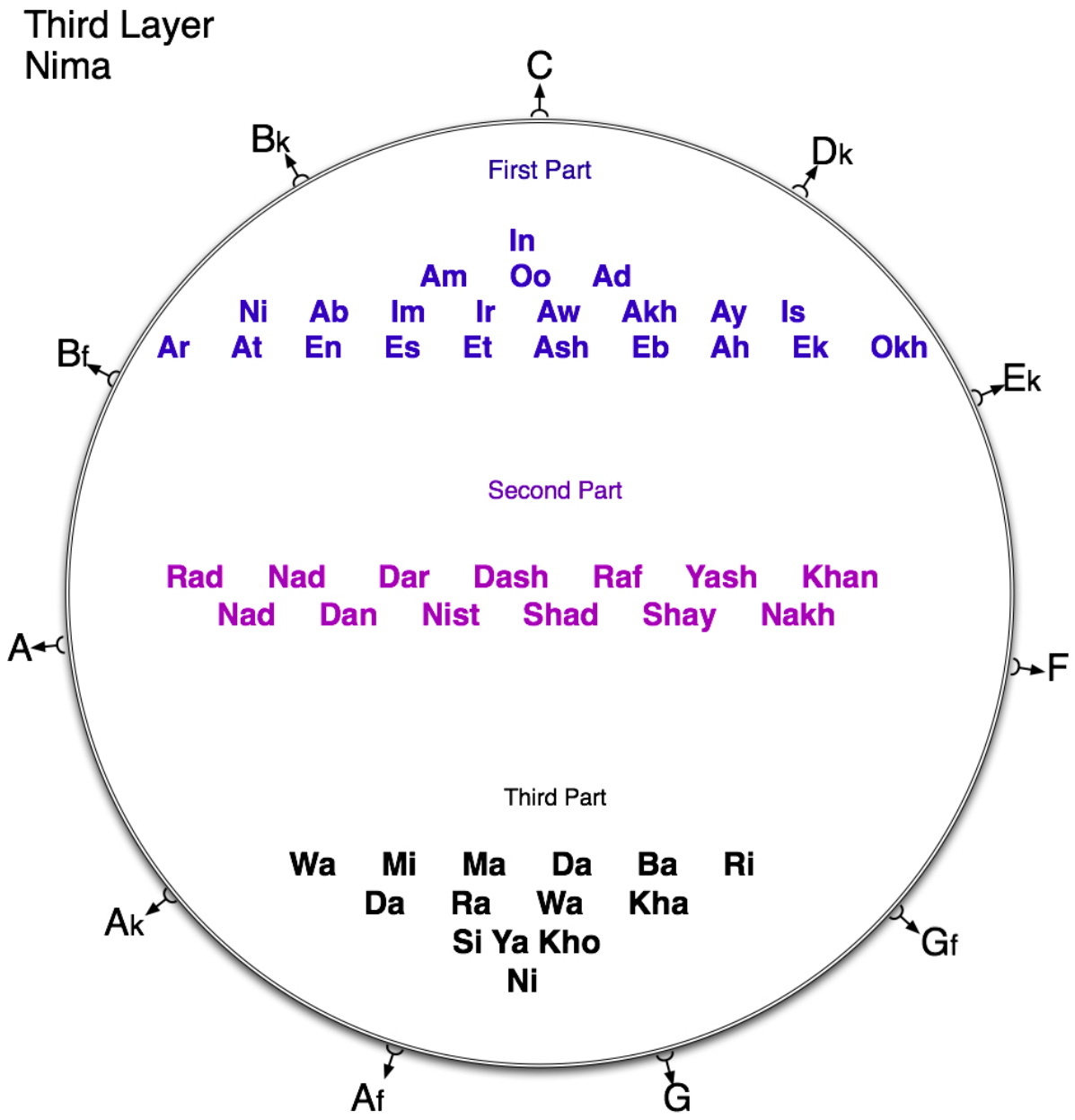


Figure 4.17 Score of third layer for Rira.

this score is, the different types of unit. There are two kinds of unit, normal and terminal. It is possible to go to and move from the normal units. For terminals, the red units in figure 4.18, although, it is possible to go to them, it is not allowed to leave them, which means all the rhythmical sentences should end with a terminal. It is just allowed to move from a normal unit to its neighbors. So, the jump is not allowed, either. Singer can freely choose any of the

normal unit, and move from it to its neighbors, and continue the movement in different circles till reach a terminal. And then should start a new movement.

The layer, at the beginning, starts with a normal unit and a terminal right after that. During this layer singer should try to gradually make longer rhythmic sentences by using more normal units. After the length of the unit clusters reached to seven units, another option become possible. The option is to stay on a unit and repeat it. The repetitions are not counted as the length of a rhythmic sentence. I mean if, for instance the singer repeats a unit for five times and then sings six different units, the length of the group of units is still seven. Singer should expand the length of the repetitions either. Obviously, at the beginning of this part, the repetitions are very short and as time goes by the repetitions become more significant, and simultaneously the length of the groups are growing as well. The expansion of repetitions should be continued to reach seven times in a row.

The repetition option is derived from a technique for adjusting poems and music in Iranian classical music. Iranian music, specially in terms of rhythmic structure, has a very strong relationship with Iranian poetry. In Persian, all of the classical poems have a very specific rhythm. But sometimes musicians prefer to use them by different rhythms. They use this repetition technique to fit the syllables to their new time signature.

For example if the syllables are: Tan Tan which is a simple 2/4, and someone wants to change it to a 5/8. He/she could change it to Tan TaTan or Tan Ta An (Tahmasebi, 2001).

Fifth layer: As you may noticed, till now, more or less, I mapped the motions to the units of sound. I mean in the first layer I mapped it to the pitch, in the second one to the expression or I can say mainly to the spectrum, in the third layer to the dynamic, and in the forth layer to the time intervals and durations. In the fifth layer singer should map the motions to the music. By music I mean, singer is free to use it in any way as she wants. It could be in expression

and then shifts to the duration and so on.

For designing the score of this layer, I tried to find Maraghi`s suggested modes in

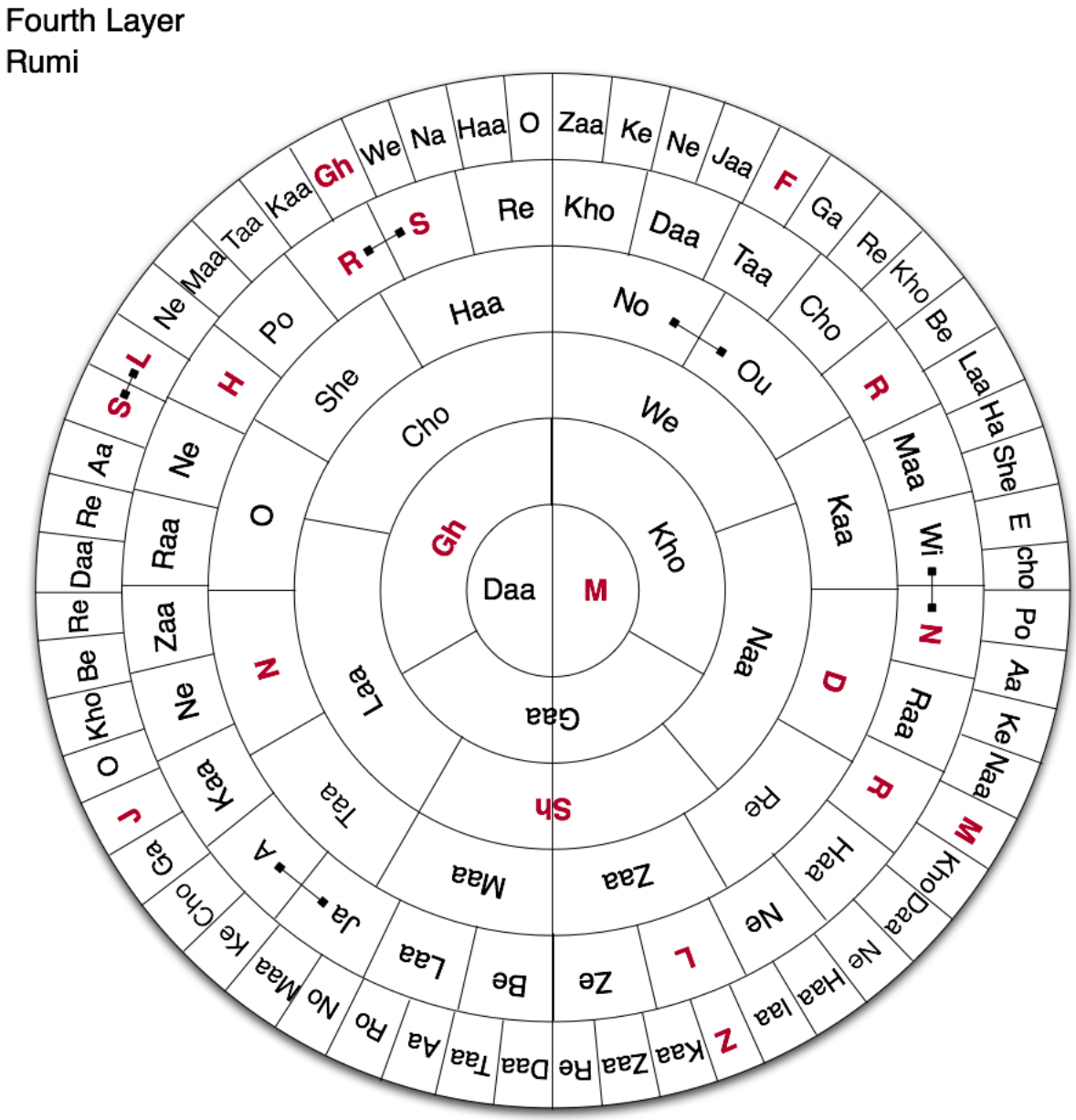
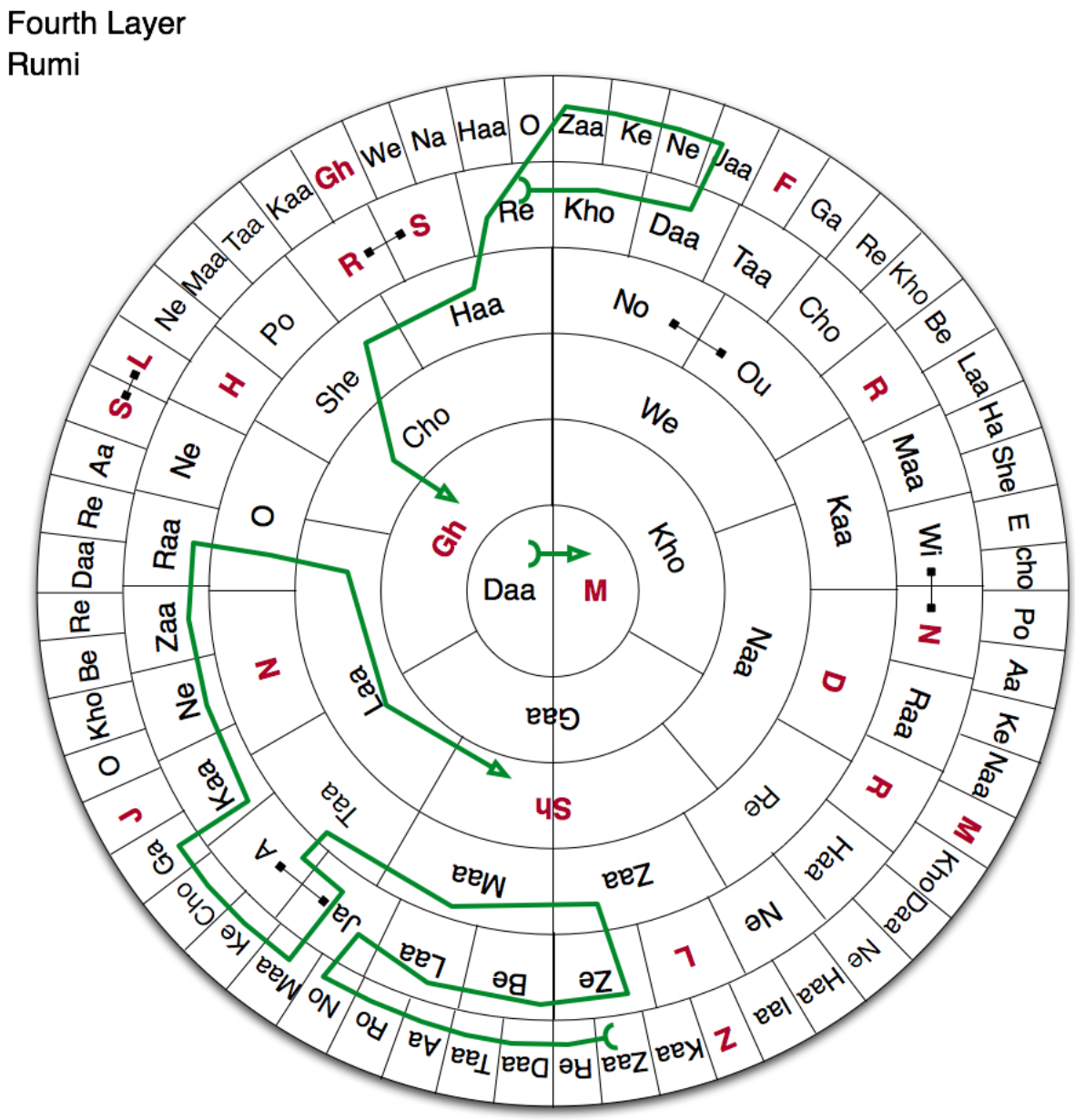


Figure 4.18a Score of fourth layer for Rumi

Radif. Although, today the Montazamieh`s modes are forgotten in practical context of Iranian classical music, it is still possible to find many of them in Radif, which can show us, how to practically use that mode. The score for the fifth layer is derived from these melodies. At the beginning of the layer, there are long groups of units with quite low pitches. As you can see in

figure 4.19, the score consists of some lines. I draw them based on the melodies of Radif with same modes of the characters. It is possible to use one line for multiple times. Generally, the lines show the pitch and time, but there is not any kind of specific scale, and singer is



4.18b Example of movements through the syllables and units of forth layer score.

completely free to sing her personal interpretation. There is only one thing that she should consider during her singing, she should choose a pitch for starting point and another for

ending point. Thus, she starts with an specific pitch, then follow the line and her interpretation of them, but finally should reach another specific tone. Thus, first of all, she should determine the starting and ending tones. Figure 4.20 shows the supplementary score for fifth layer, which shows how to choose tones for starting and ending points of each line. Singer should always start with number one, and then move to one of its neighbors. For second line she should choose the ending tone of the previous line and then choose one of its neighbors again. It is not allowed to use a unit more than one time. And it is possible to jump from a number to the same number on other locations of the table. The neighbors of each state are not larger than the value of the state plus four and consequently melodic jumps are limited in a tetrachord. The setting of the numbers is in such a way that moving away from the number one in any direction, will result in larger numbers. The next rule is that, it is not possible to do two successive vertical movements. The main objective, of these movements is to reach number 22. There are four 22s in the table and each character should reach its own summit. In fact the numbers are the degrees of the mode in three octaves. So, number 1 is the lowest tonic, and number 22 is the highest one. As I talked about in Chapter three [p. 33], Iranian improvisation has a gradual and upward melodic morion and the main goal of this layer is to emphasize on that overall upward motion from the lowest pitch to the highest ones. This was the story of scores for singer in my piece.

4.16 Geometrical Redemption

In Sufism a square is the symbol of earth and physical materials. On the contrary, a circle is the symbol of sky and spirituality. The most important obligation of a Sufi is to transform a square, which is in fact his physical being, to a circle (Ardalan & Bakhtiar, 2001). But as long as a sufi is alive, since he has a minimum of physical being, a perfect circle is

unreachable. Therefore, until the complete death of a Sufi`s physical body, he/she should try to transform a square to an octagon. The procedure of this transformation is called *Mandala.*

> The most significant expression of the interaction of the circle and the square in traditional art is Mandala. [...] [Mandala] as the reflection of the cosmos and the cosmic processes with all things works through numbers and geometry, beginning with unity at its center, moving through manifestation and coming back again to Unity at its perimeter. (Ardalan & Bakhtiar, 2001, p. 61)

Mandala is one of the main elements of Iranian art and it has been abundantly used in Iranian architecture. By considering the strong relationship of architecture and space, I decided to use this idea as the fundamental core of my spacialization pattern.

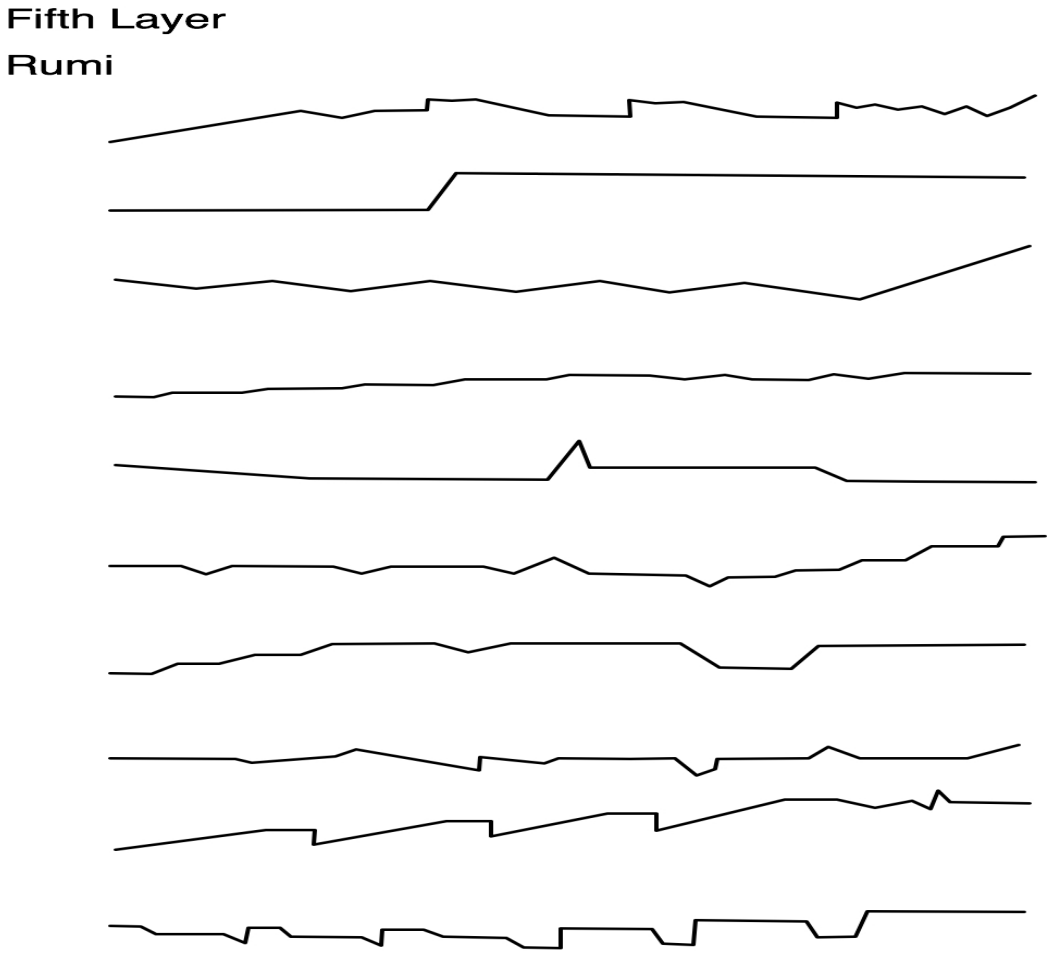


Figure 4.19 Score of fifth layer for Rumi

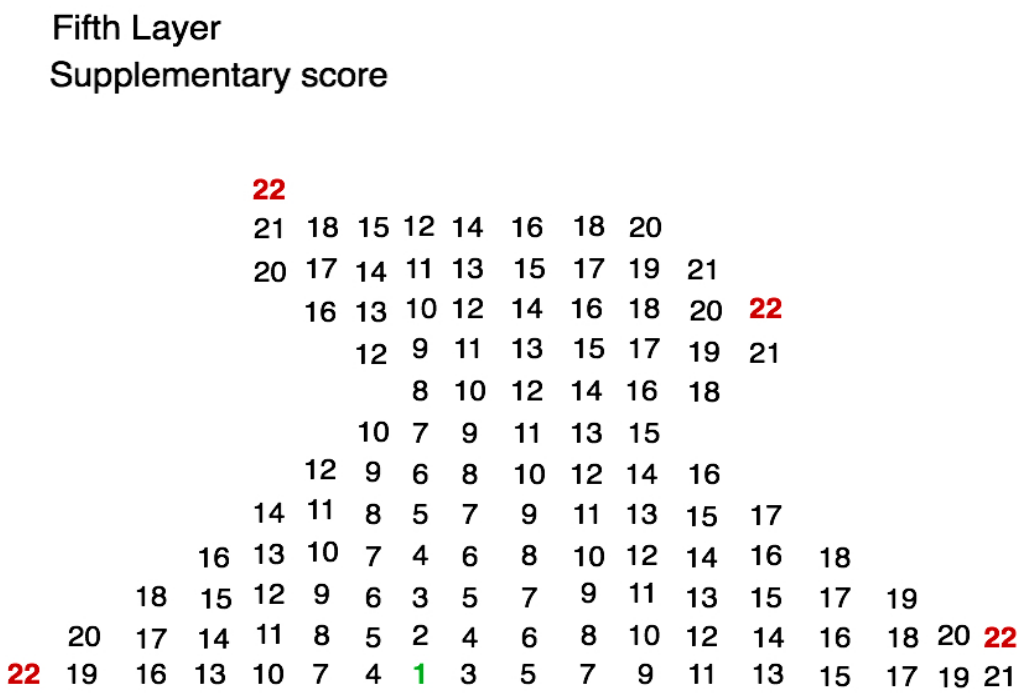


Figure 4.20a Supplementary score of fifth layer.

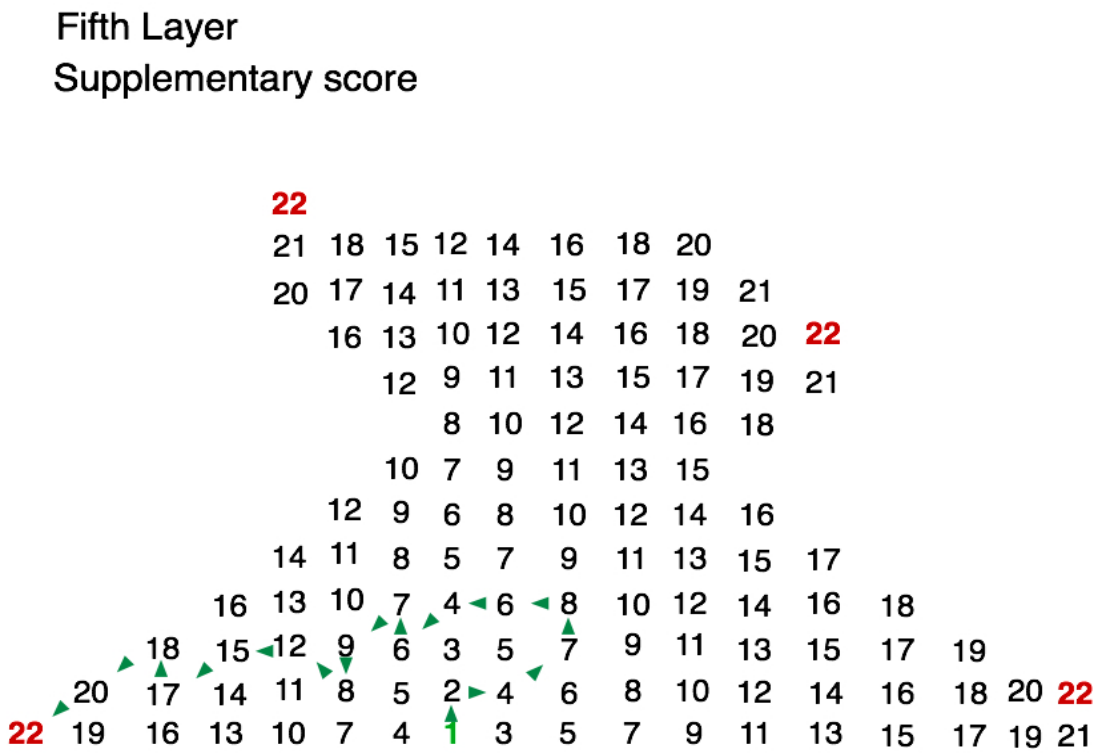


Figure 4.20b An example for using supplementary score of fifth layer.

4.17 Spacialization and Time Score

Mandala has a very specific meaning and function, it is the reflection of the cosmos. So, I can say a redemption, in Sufism, happens by showing the world as a traditional man used to know it. Therefore, the function of Mandala is reflection. Now consider that fragmented identity, the different identities which all together make a total identity. Each of them could be a part of a heterogeneous Mandala. And the only way to show a complete Mandala, is to reflect this totality, which consists of different elements. Thus, the redemption is a complete reflection of selfs, and only at the moment of redemption the octagon shows itself.

The main objective of this piece, specially in terms of spacialization, is to transform squares to octagons. Each character has seven squares, one for each layer. The sides of each square are recorded vocal materials for that layer. So, each side has an specific duration. Figure 4.21 shows my idea of squares and the lengths of the sides of the squares. In fact, these squares are new possible scores for me. Now imagine, the sides of squares are tapes which contain the vocal materials, and I have infinite playing heads in my hands and by putting the heads on the different parts of tapes, I can play the vocal materials. Figure 4.22 is an imaginary setting of squares for the four characters.

Of course, music is a mater of time and it is not possible to present the sounds in the same way of picture. This matter had occupied my mind for a long time, and everyday I was thinking how to present this idea in a musical form. Finally, I decided to break the sides of squares, and design a separate and unique deformed shape for each one. Figure 4.23 and 4.24 show two of the designations. They all start with a square and end with a similar form, but between them, the designations are completely different. And each square has another possible score for the direction and duration of the material, which is derived from the spatial

possible score. Figure 4.25 and 4.26 show these direction and duration scores for the same characters in figure 4.23 and 4.24.

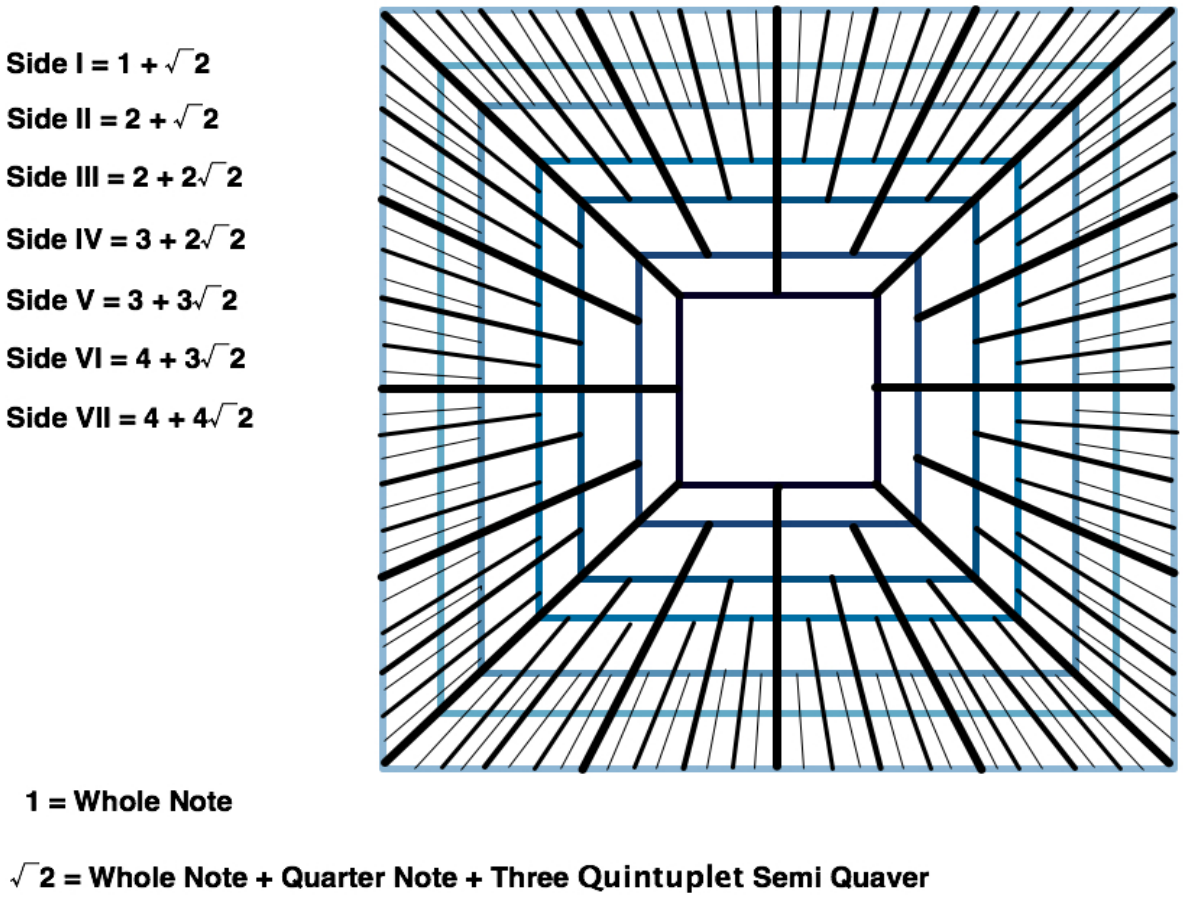


Figure 4.21 Seven squares of a character.

In fact, these forms are completing a larger scheme. Figure 4.27 shows the spatial scores of all characters in sequences of seven layers of the piece. As you can see in the figures, at first they are four separate squares, but during the course of the piece the sides of squares are getting broken, and expanding themselves through the space and touching the other squares, and finally at the seventh layer they, all together, make two octagons.

I designed these shapes based on the architecture of one of the domes of Jame mosque of Isfahan. I could not find a clear picture of it. In figure 4.28 I tried to give an overall picture of it.

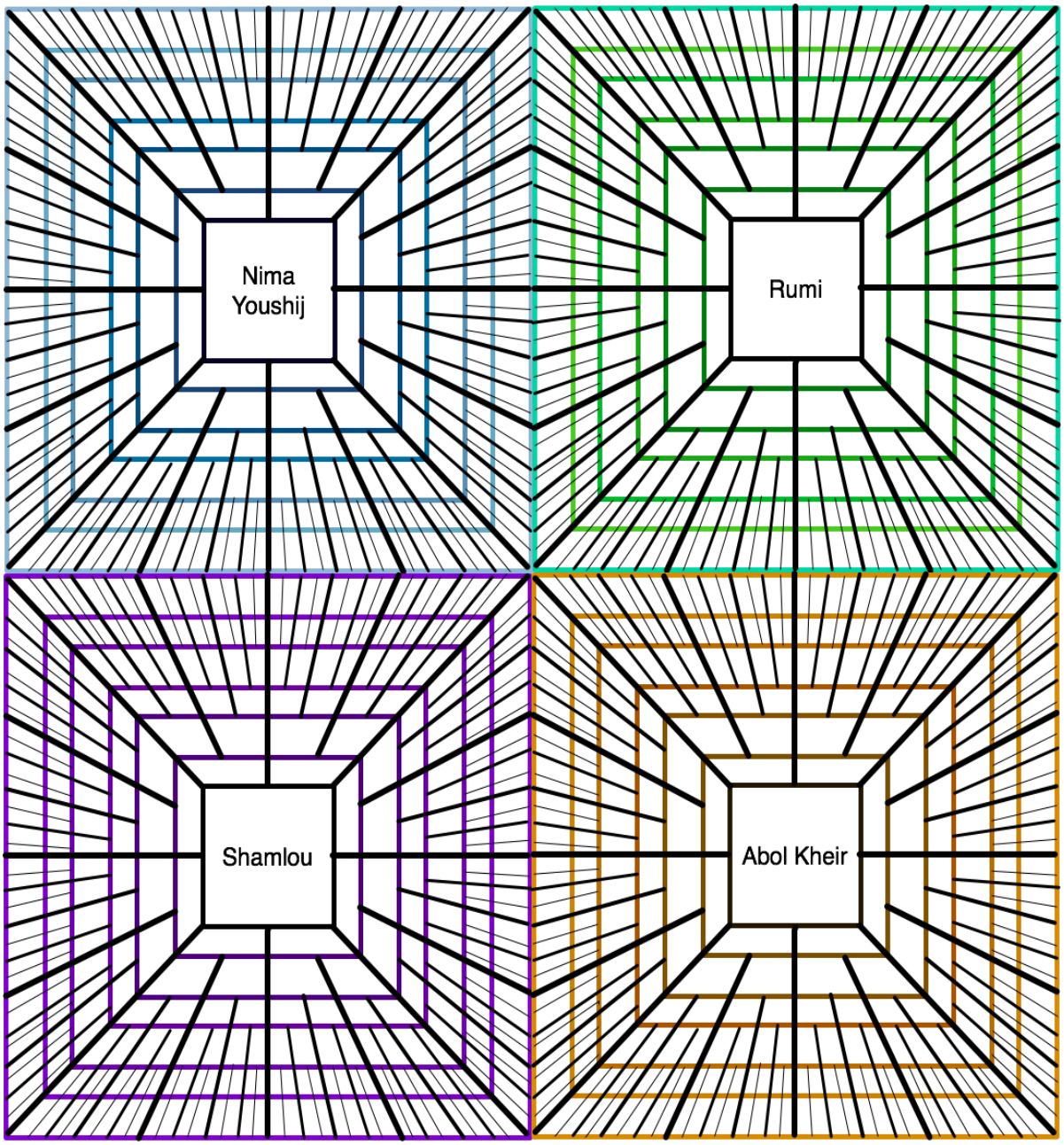


Figure 4.22 Imaginary setting of squares for all characters.

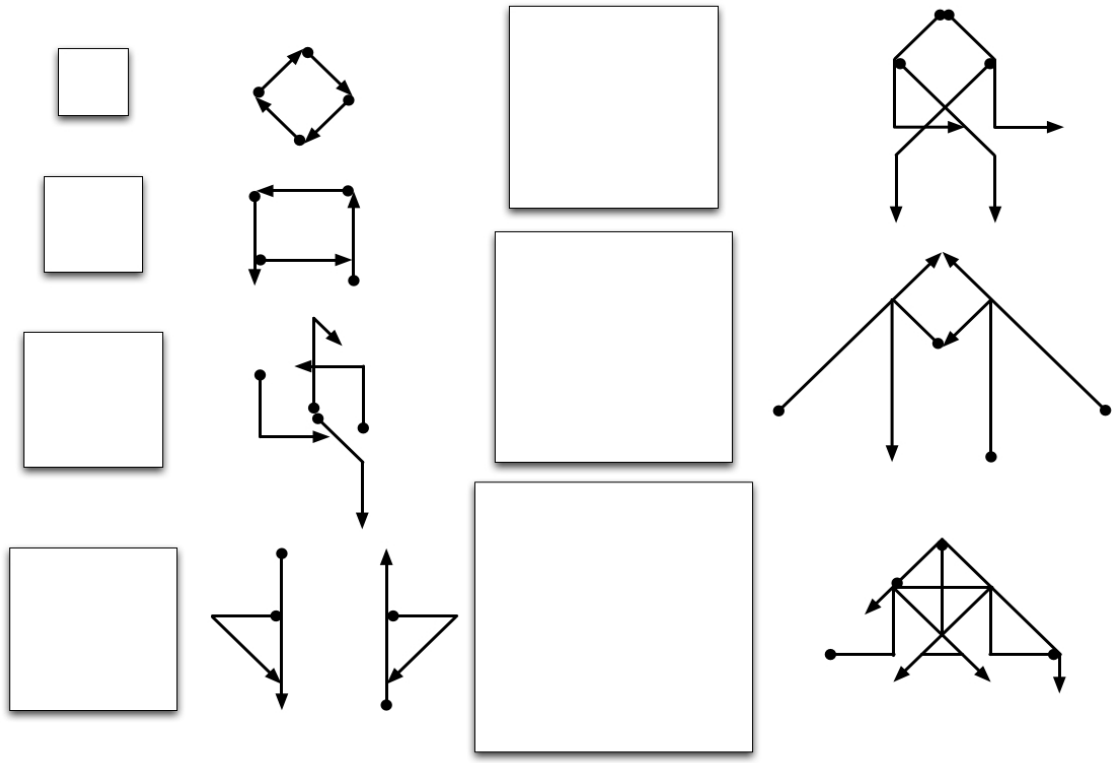


Figure 4.23 Spatial possible score of seven layers for Abol Kheir

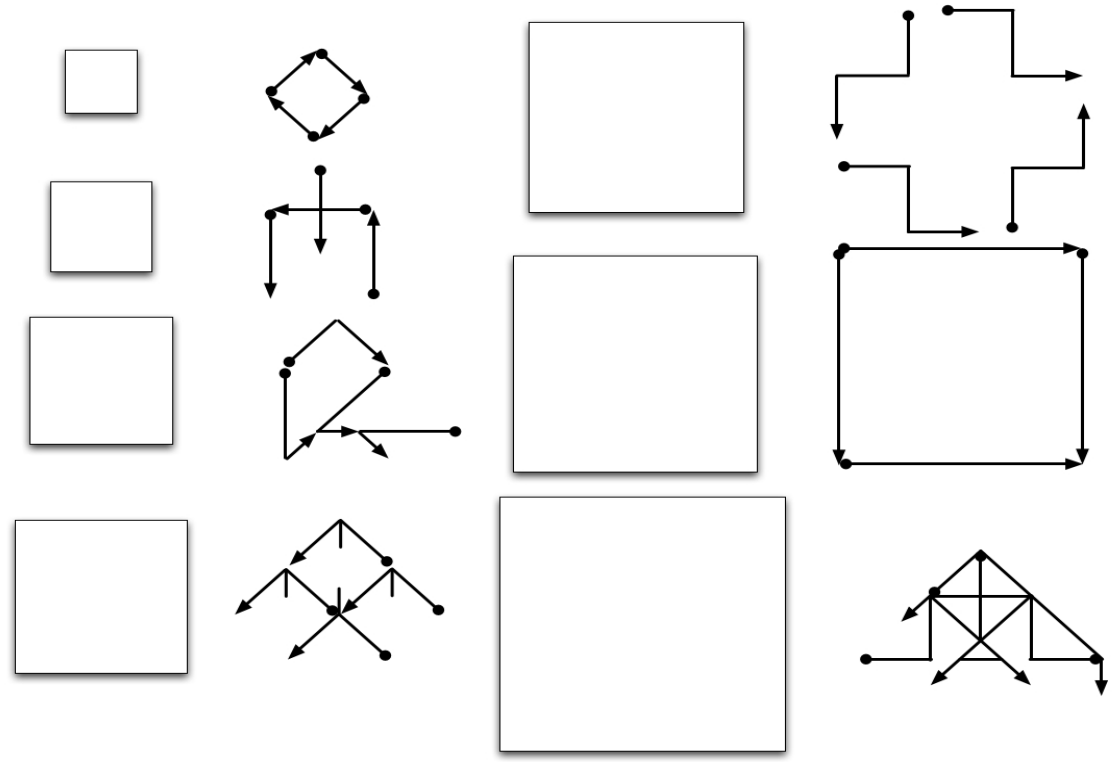


Figure 4.24 Spatial possible scores of seven layers for Shamlou.

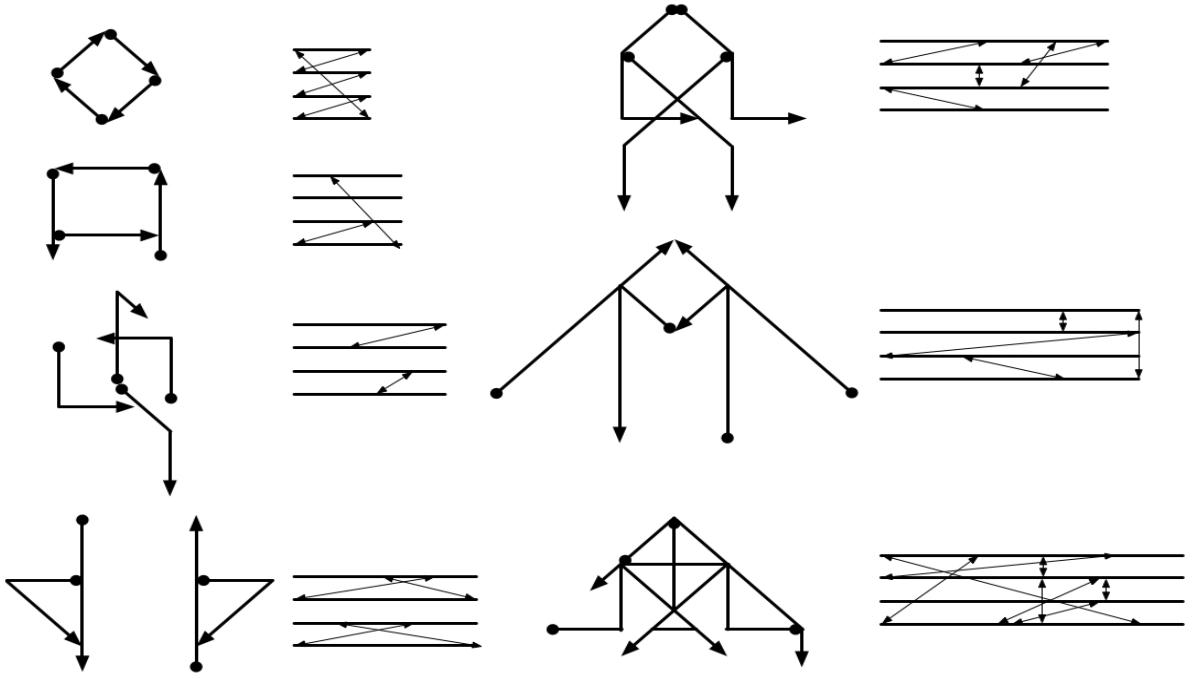


Figure 4.25 Time score of seven layers for Abol Kheir

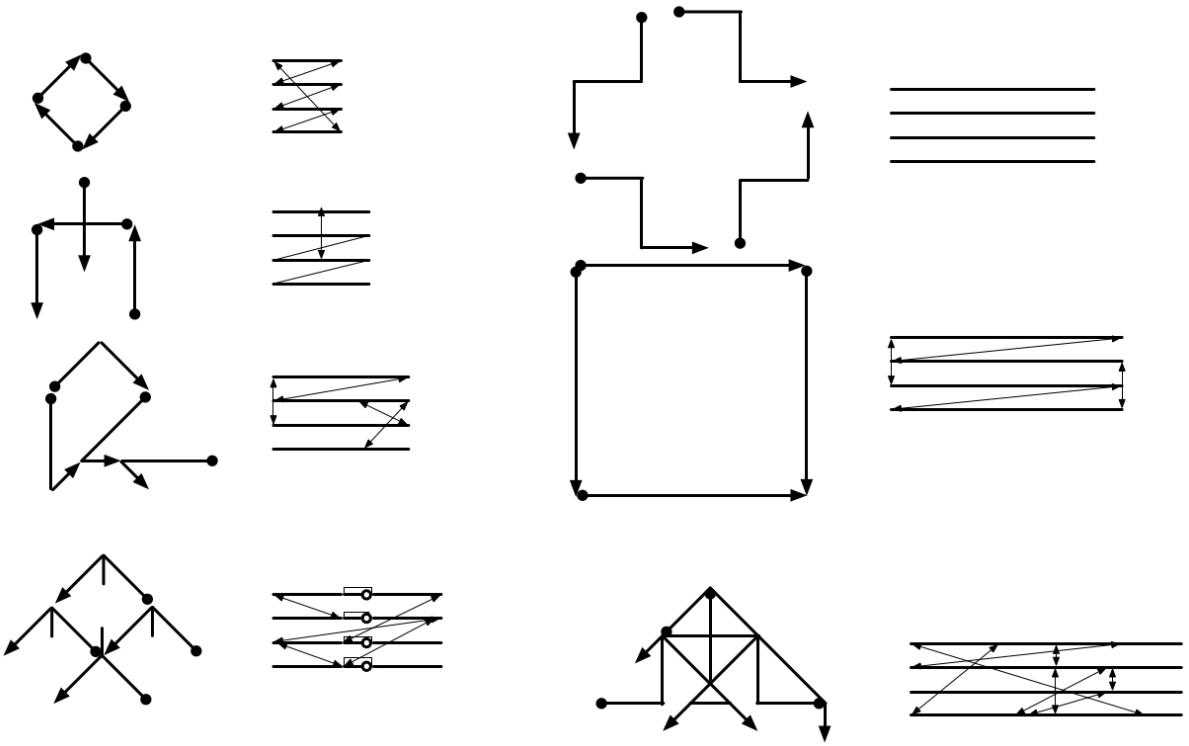


Figure 4.26 Time score of seven layers for Shamlou

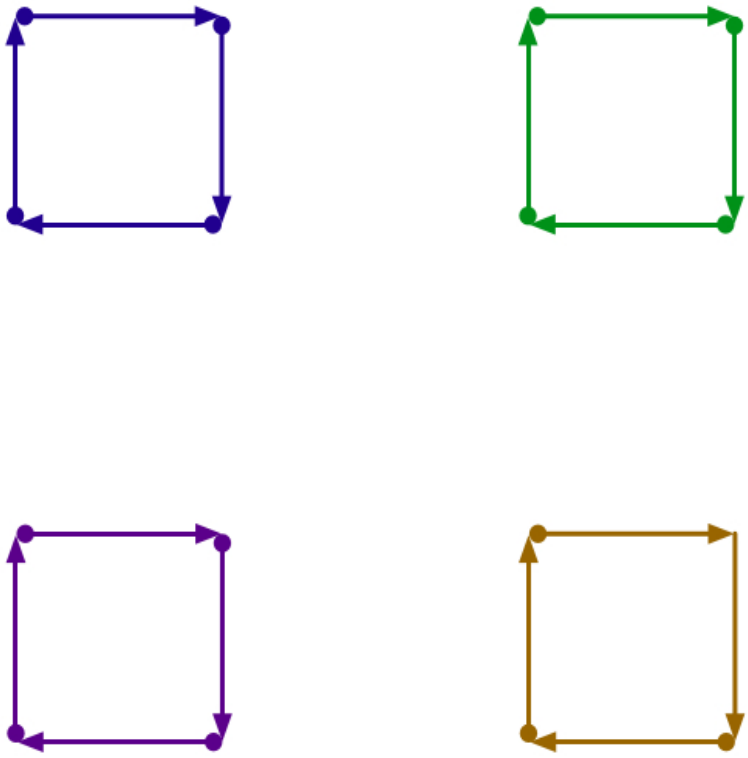


Figure 4.27a All spatial scores of first layer.

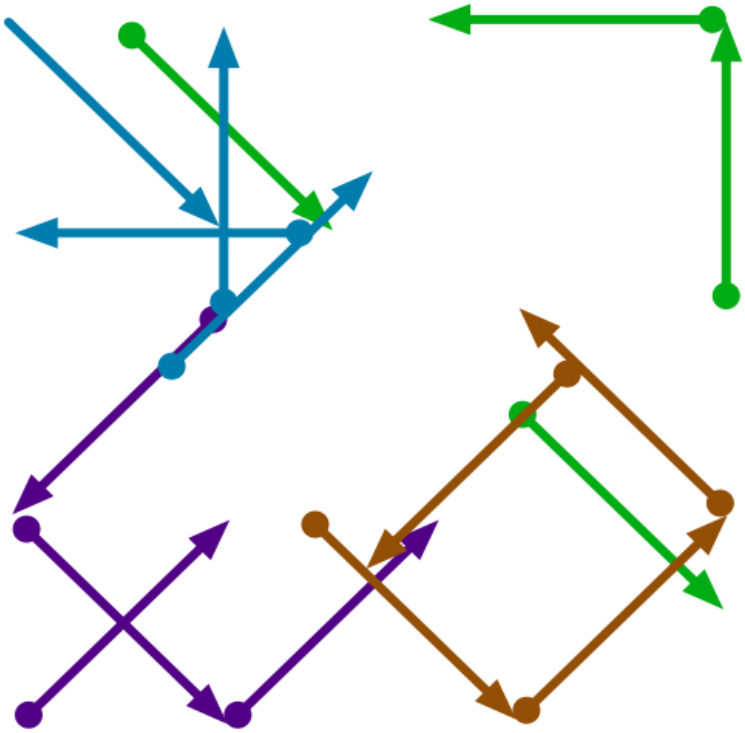


Figure 4.27b All spatial scores of second layer.

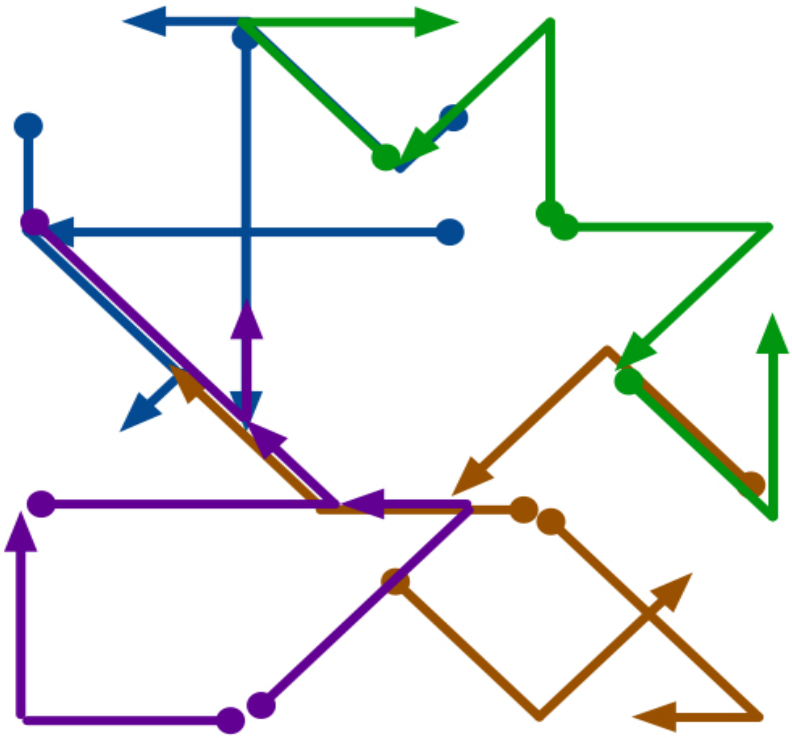


Figure 4.27c All spatial scores of third layer.

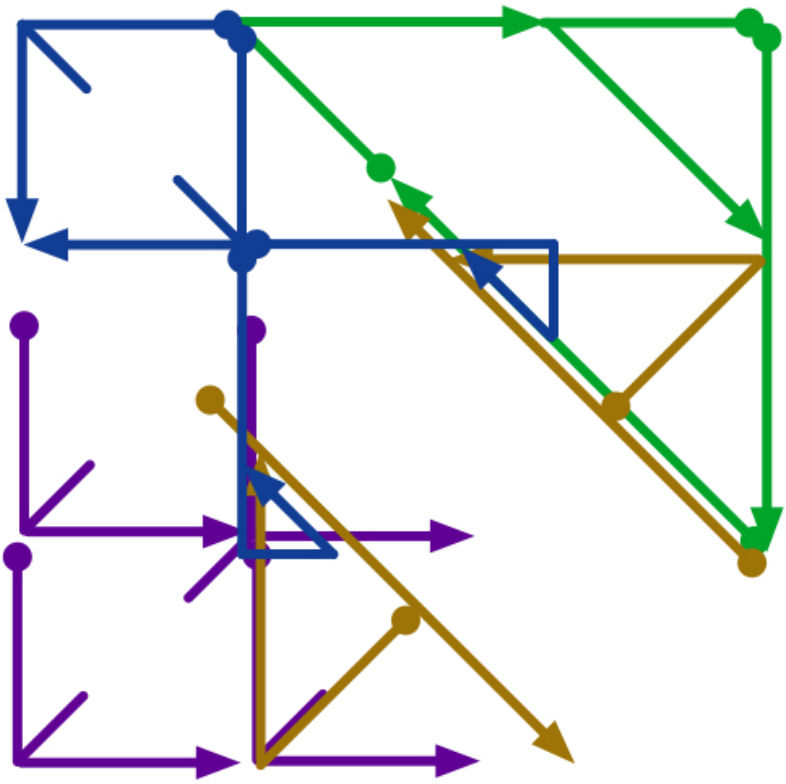


Figure 4.27d All spatial scores of forth layer.

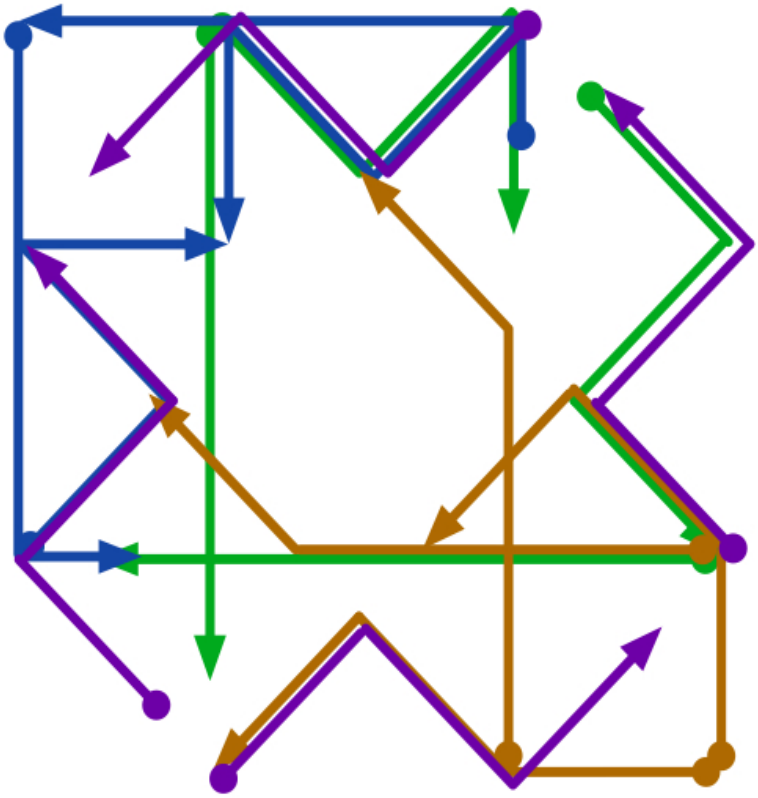


Figure 4.27e All spatial scores of fifth layer.

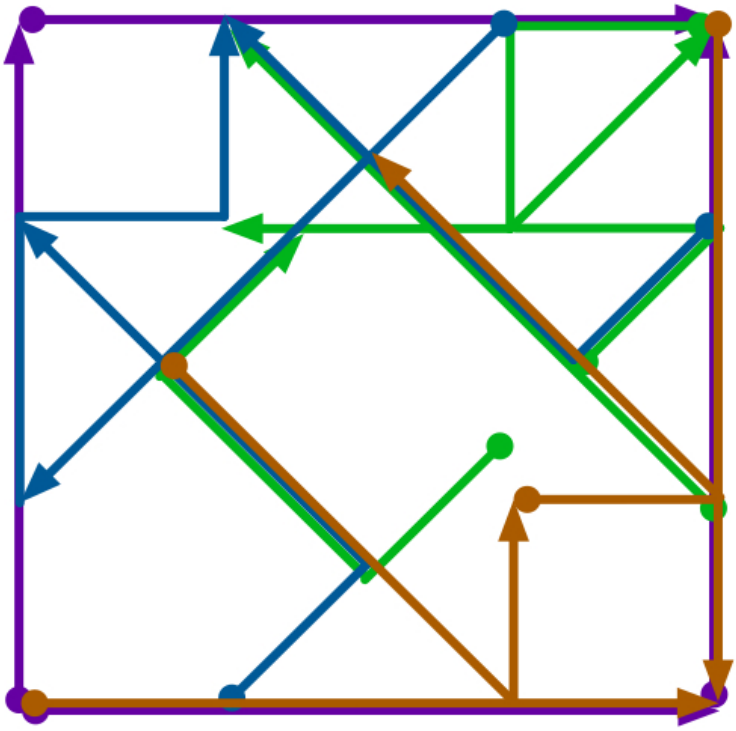


Figure 4.27f All spatial scores of sixth layer.

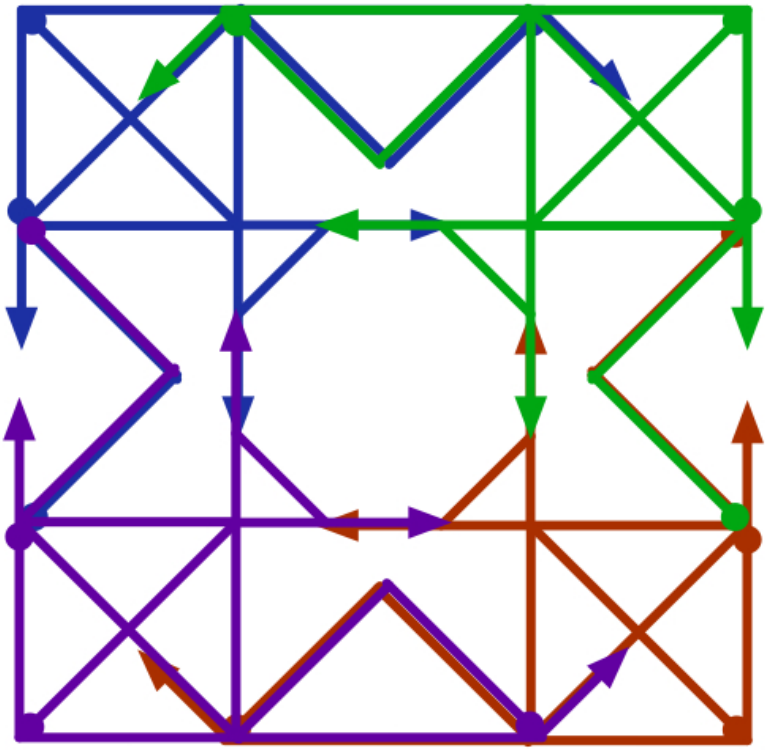


Figure 4.27g All spatial scores of seventh layer.

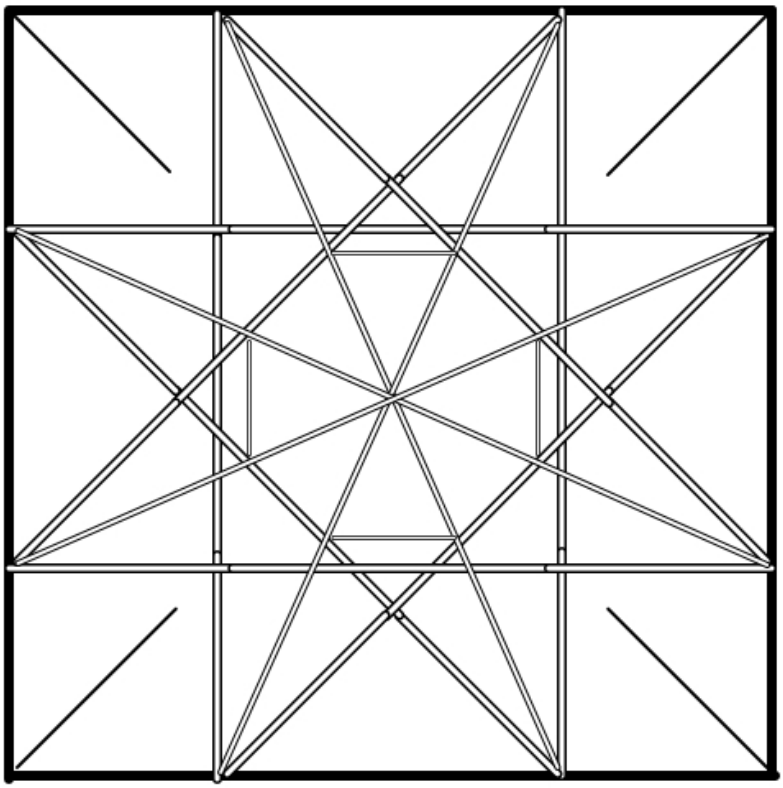


Figure 4.28 The dome of Jame mosque of Isfahan (Ardalan & Bakhtiar, 2001, p. 60)

4.18 Sound Transformation and Shadows

In this piece, all the sounds, or I can say all the sides of squares, could have some shadows. For understanding my idea about the shadow let me give an example: Imagine there is a very nice and attractive man in front of you and he is asking you to come closer with a very nice and kind smile. Suddenly you see his shadow on the wall and see he is hiding a dagger behind himself. In fact, the shadows can give us such a multidimensional view. My main idea for transforming the sounds is very close to this idea. I want to flash a light on my sound objects from different angles, to give a multidimensional view of the objects.

This part strongly revolves around the idea of improvisation. I mean I should improvise the shadows or transformations, and since improvisation in Iranian music as Farabi described it, is " Composition without any kind of preplanning." (Safvat, 2010), talking about precise plans could be contradictory. But it does not mean that I can not give an overview of my idea.

As I said the main function of transformation in this piece is very similar to a shadow. For improvising the shadows, first of all I composed the squares side, which are different tracks of vocal materials, and juxtaposed them based on their time scores. And then I transformed different properties of sound objects in an improvisational manner and by using different techniques. For example if the transformation technique is granular synthesis, I would control the number of layers, grain size, position in the buffer, pitches, direction and etc. by improvising their values in a realtime procedure by my midi controller. There are plenty of techniques such as granular synthesis and FFT, which are capable of performing the idea of shadow. But the technique that I want to talk about here is Trevor Wishart`s *Waveset* (Wishart, 1994). Waveset is a technique for spectral transformation in the time-domain by operating on pairs of zero-crossings, or as Wishart named them wavesets(1994).

Determination of zero-crossing pairs and the respective amplitude of a signal between those two zero-crossings, makes it possible to do a series of time-domain transformation. For example it is possible to replace the original waveset with a square or triangle wave, invert or reverse the original waveset, perform a signal stretch by repeating the waveset for couple of times or any other kinds of distortion or substitution (Wishart, 1994). Since for all of these transformation the amplitude of the waveset remains the same, the sound object keeps its overall characteristics. But the interesting point about waveset is, its very unpredictable nature, which could always surprise a sonologist. Figure 4.29 shows some examples that I made by this technique. Figure 4.29a is the original sound object. Figure 4.29b and 4.29c are waveset substitutions by square and triangle waves. Figure 4.29d is a waveset inversion, figure 4.29e is a waveset reversal and figure 4.29f is a mixture of waveset reversal and inversion. Figure 4.29g shows a waveset 101 omission, which means in a row of three wavesets, the middle one should be omitted. And finally figure 4.29h shows a waveset stretch, as you can see each waveset has been repeated for six times.

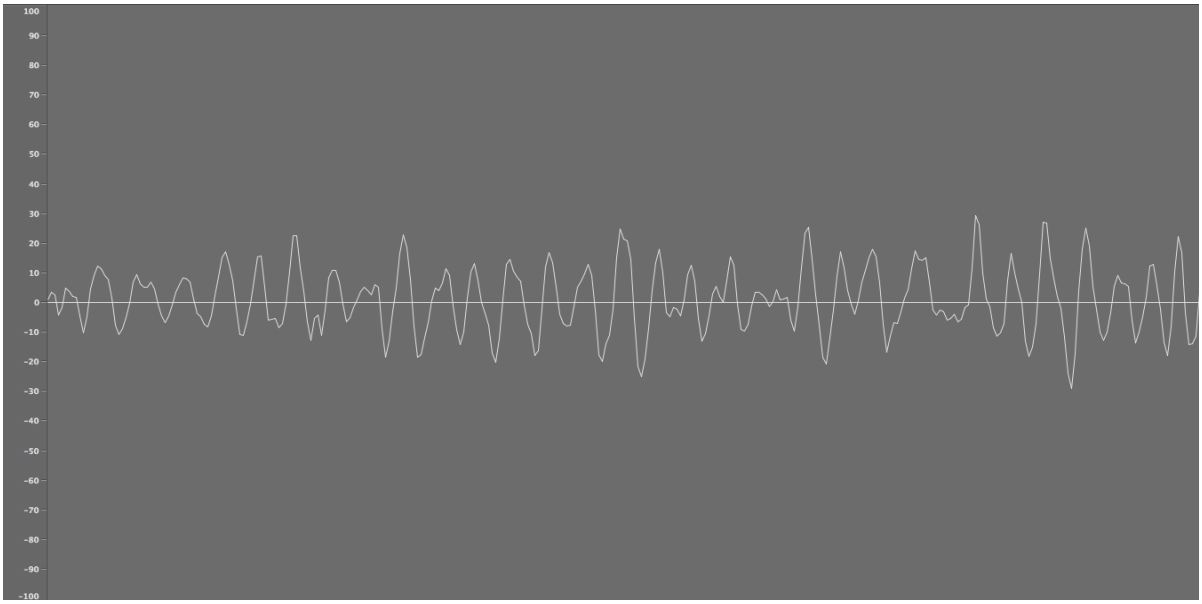


Figure 4.29a Original signal

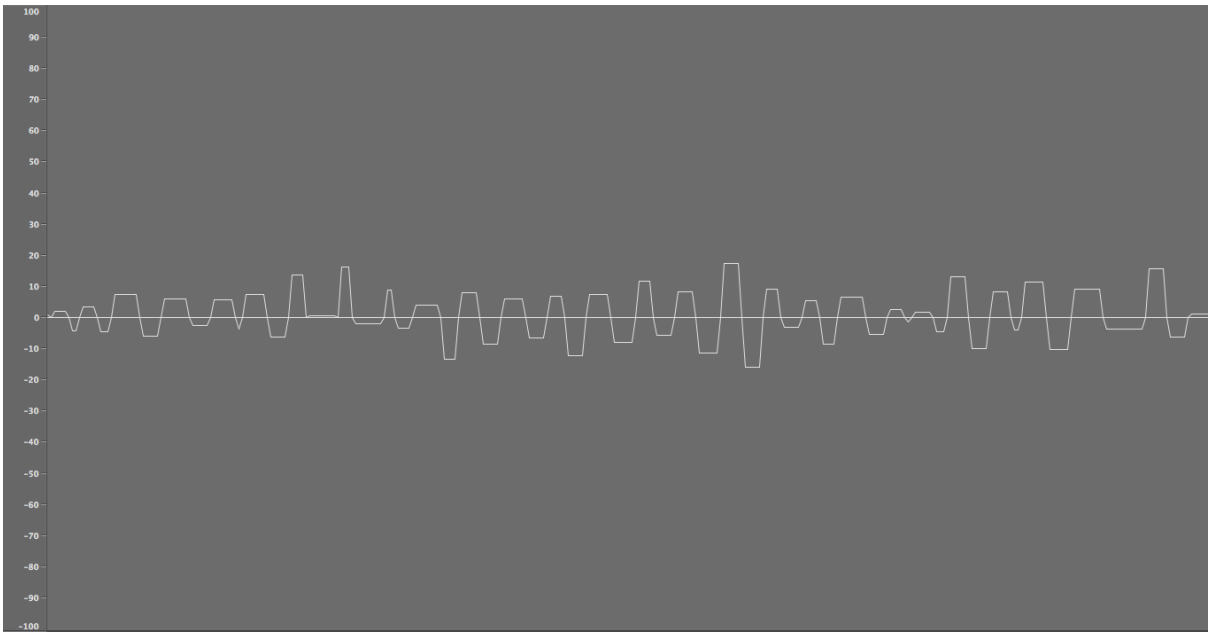


Figure 4.29b Waveset substitution by square waves

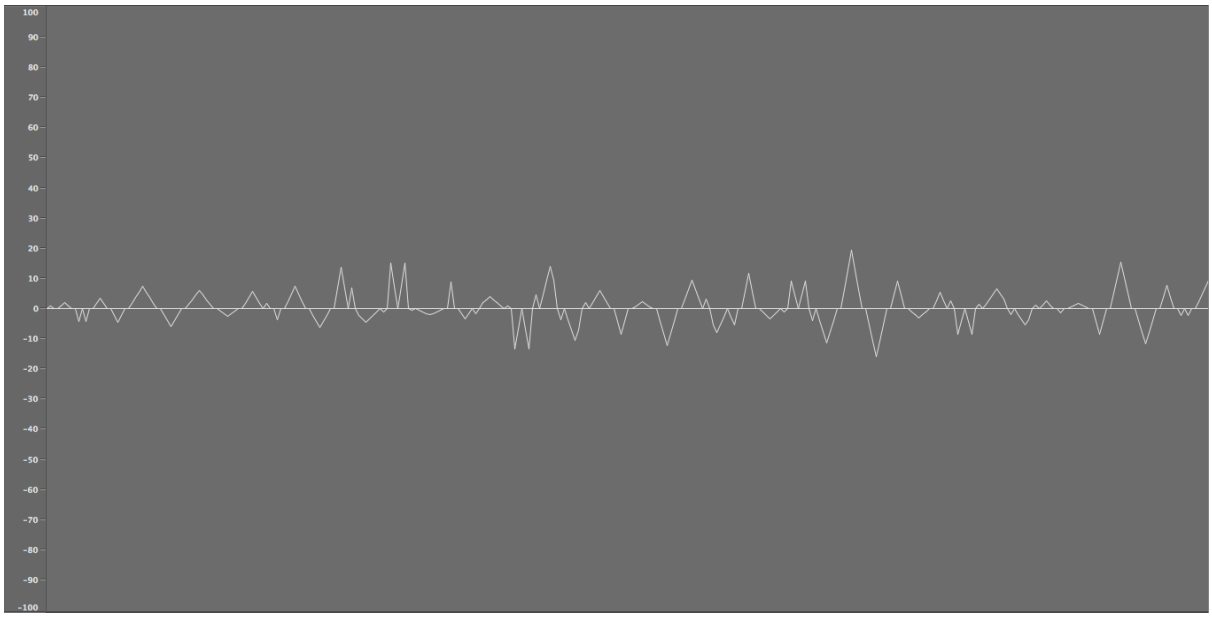


Figure 4.29c Waveset substitution by triangle waves

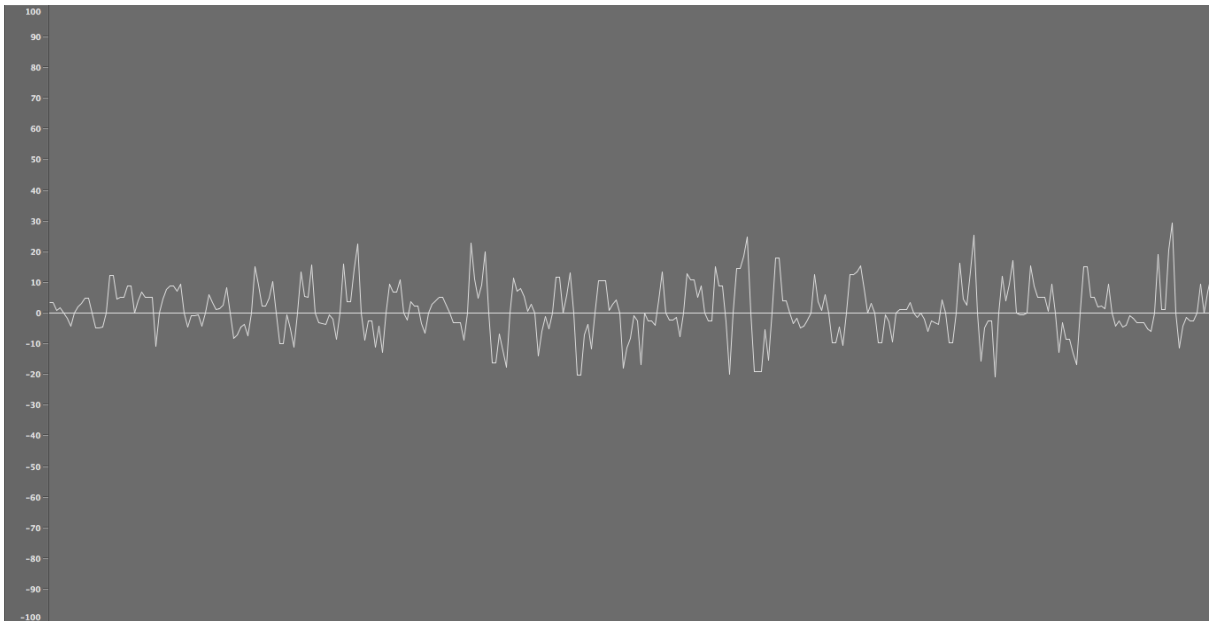


Figure 4.29d Waveset inversion

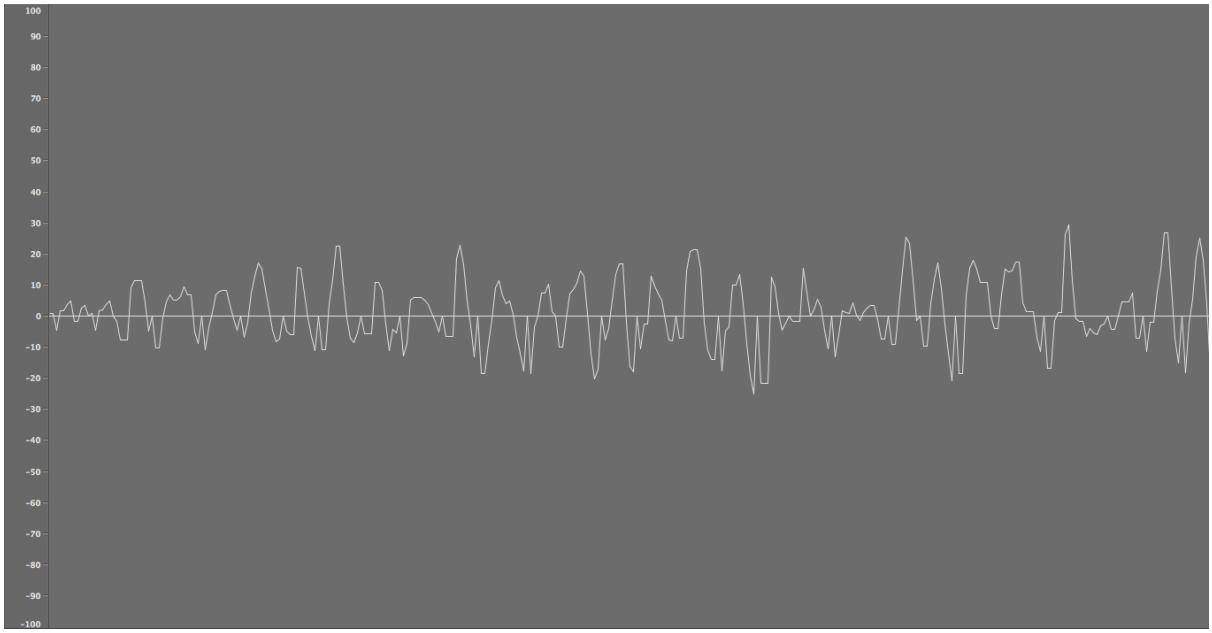


Figure 4.29e Waveset reversal

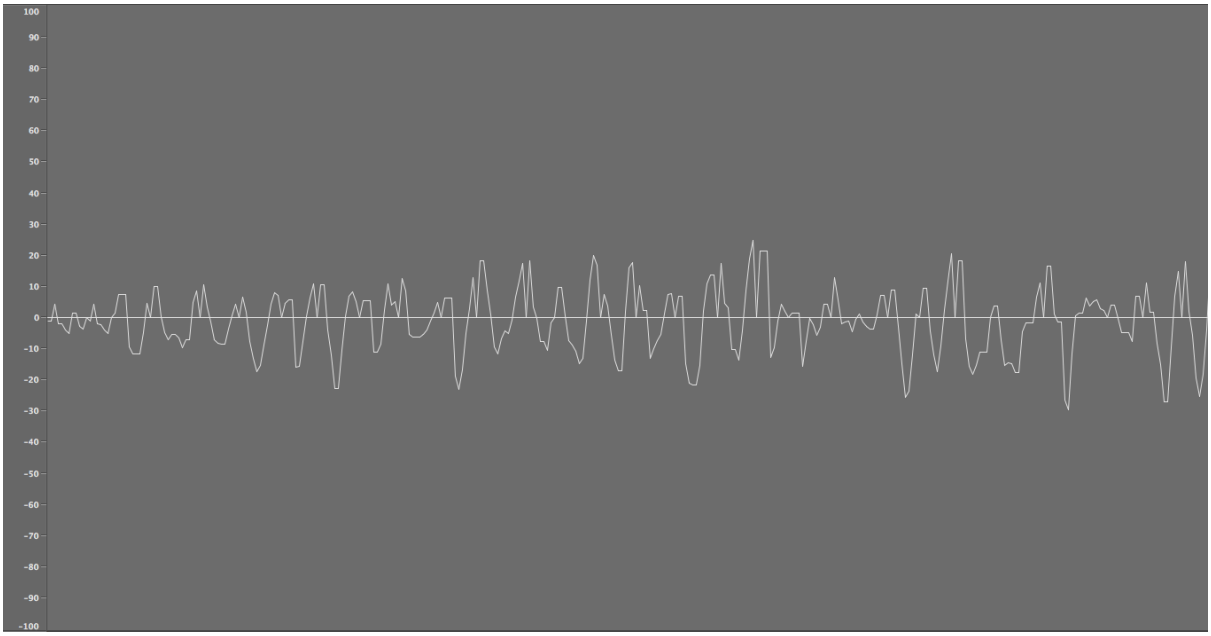


Figure 4.29f Waveset inversion and reversal

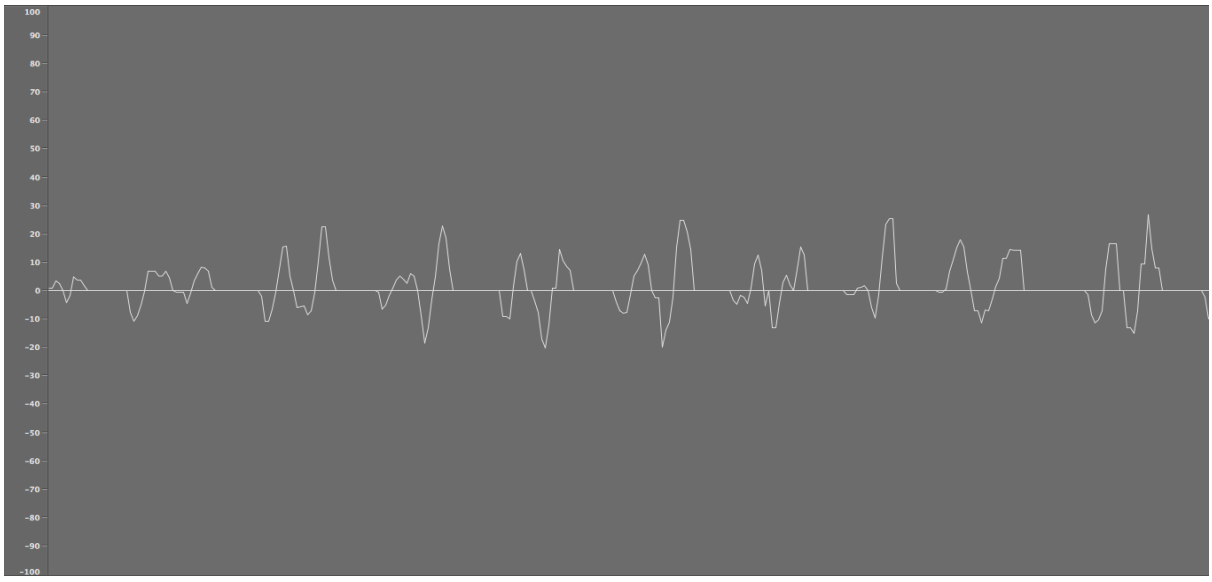


Figure 4.29g Waveset omition

Figure 4.29h Waveset sterch

I do believe the revelation of the essence of an object is a two steps job. The first step is analysis, and the second step is to put the object in different atmospheres. Let me give an example, consider we want to reveal the essence of a text. First of all we should syntactically and semantically analyze the text in context of its original language. Although, it could reveal lots of hidden aspects of the text, it is not enough. The next step is to translate it to different languages. By any translation the text loses a part of its shell and starts to show a part of its essence. Because that, I mean the essence of the text, is exactly the thing which makes it possible to translate it to other languages, a pure idea which itself stands out of the realm of the languages and shows its presence by filling the void between different languages. The function of waveset and generally the shadows in my piece is very similar to the idea of translation. In this way by multiple transformations of sound objects, I am trying to reach their essence. Even the general approach of the piece is constructed based on the same idea. I mean in this piece, oppose to my former pieces which were all composed by just one or few short sound objects, I took a very maximalist approach. My recorded vocal materials are more than twenty hours, and all of them are different versions of same few words, modes, melodies and sound objects. And, at least I hope, the essence of these words, modes, melodies

and sound objects will reveal itself in the empty spaces between the different versions.

4.19 A Short Comment on the Title

Keykhosro is one the main characters of Iranian mythology. He rises up to take revenge from his grandfather, Afrasiab, who has killed his father, Siavash. But after killing Afrasiab he decides to wipe all devils and demons off the world. Many of Iranian mythical characters had tried to do such a thing before him, but non of them was successful. He is the only one who has successfully eliminated all the devils. His smart, powerful, pure and brave character made all other mythical champions to bow in front of him and chose him to be the king of the kings. But exactly at the moment that he could begin his peaceful and powerful monarchy, he makes a weird decision. He decides to commit a suicide. So, he and four of his warriors go to the mountains and vanish in snow and in Iranians opinion they have gone to the eternity, Nirvana. In my opinion, in fact Keykhosro refuses to force the unnamable[11] of the situation of being a king. I can say the unnameable of the situation of being a king is power or concupiscence of power. He does not force to name himself the righteous king, because he knows it is impossible. Thus, he kills the last devil, which is his Self.

11 I took the terms *unnameable* and *force* from Alain Badiou`s philosophical lexicon, for more information refer to Alain Badiou`s *Infinite Thoughts* (Badiou, 2004).

Conclusion

In conclusion I want to talk about two issues. First issue is, what should be the result/s of this project. And the second issue is, what is/are the next step/s for future studies in the field of this project.

If I want to summarize this project in two words, I would say destruction and construction. Destroying Iranian music to reach its fundamental elements, and constructing a new construction by those fundamental elements. The destruction occurs by analyzing different aspects of Iranian classical music. And the construction is exactly the point of creativity in this project which is composition. As I said before I do not want to define a codified style of music, so the constructions, or compositions, could have any shape. But all of them should have one important and in common feature. All of them should be very absurd. Let me explain this absurdity by the story of *The music of chance* (1990) a novel by Paul Auster.

Jim Nashe, the main character of the novel accidentally meets a gambler, Jack Pozzi. The two hatch a plan to fleece a couple of wealthy bachelors, Flower and Stone, in a poker game. The two millionaires also bought ten thousand stones, each weighing more than sixty pounds. The stones were from the ruins of a fifteenth-century Irish castle destroyed by Oliver Cromwell[1] (1599-1658); Flower and Stone intend to use them to build a *Wall* in the meadow behind their mansion. They lose the game and Flower and Stone ask them to build the wall as

1 An English military and political leader.

a way to pay back their debt (“Plot summary of The Music of Chance”, n.d).

Of course, Auster`s intent of building the wall is different from mine. But I want to talk about the similar actions of destruction and construction in my project and the novel. In my project, Iranian classical music is that ancient building and I have tried to destroy it to reach its fundamental elements, or I can say its stones, which are its modes, rhythms, melodies, concepts and etc. And now it is for a while that I have been trying to construct a new object by using the same materials. The new object which is the result of my project, should be something like the wall in Auster`s novel. Because, in this new object the elements lose their normal functions. They do not act as a part of a building, rather their function is to present themselves as a part of an absurd construction. Like a stone that used to be a part of a column of a building, but now it is just a stone in a wall or like a syllable that used to be a meaningful part of a word, but in my piece, although, it would be still the syllable, it acts as a part of a pseudo-word which does not have any meaning. Reducing the three dimensional space to a two dimensional plane, give this opportunity to these elements to do not care about their former functions and just talk about themselves. And more over, this construction should be build by the same fundamental concepts such as *absurd but glamorous* meaning of love and pain in Iranian culture, which Iranian composers have been using them for thousands of years. As a conclusion I want to say, first of all destruction is not the whole procedure, because the result of destruction is a bunch of solo and isolated elements, and an isolated element can not talk about itself that much, because it has lost its history, meaning and soul. Thus, the fundamental elements should be used in a new construction which is quite similar to the former construction. Secondly, since the fundamental elements have a very strong organic relationship with each others, all efforts for making new rational relationships between them in order to make a new and logical construction would result in the former

construction, Iranian classical music in my case, or a simplistic version of it. So, the only way to construct the new construction is to make a very absurd construction, like building a huge wall by the stones of a building. This was the fact that I had been disregarding during the first year of my master. I think this is the most important conclusion that I have grasped through this project.

For this project my point of focus was Iranian culture and its roots. I think the next steps for this project should more focus on issue of being Iranian as a part of contemporary world, and try to explore the hidden layers of situation of being an Iranian composer in context of the contemporary world. I think a good question to look for its answer/s could be: "Is it true to say, if a composition is a new subject in context of Iranian contemporary music, it is consequently a new subject in context of contemporary music of the world?" If the answer is no, how it could be possible to do so. And how it could be possible for an Iranian composer to present his compositions not as an exotic cultural product, rather as a piece of art or music.

References

Ardalan, N. & Bakhtiar, L. (1973). Morphology of Concepts. In *The Sense of Unity: The Sufi Tradition in Persian Architecture*. Chicago: University of Chicago Press.

Auster, P. (1990). *Music of Chance*. New York: Viking Penguin

Badiou, A. (2004). Philosophy and Truth. In O. Feltham and J. Clemens (Ed. and Trans.), *Infinite Thought*. London: Continuum.

Bardakci, M. (2010). *Maragali AbdulKadir*. (T. Sobhani, Trans.). Tehran: Matn Publishers.

Barkeshli M. (2010). *Farabi`s Scientific Views on Music*. Tehran: Matn Publishers.

Behjat, A. (2000). *Radif of Mirza Abdolah*. Tehran: Mahoor institute of Culture and Art.

Coomaraswamy, A. (1956). The Theory of Art in Asia, In *Transformation of Nature in Art*. New York: Dover Publications.

Corbin, H. (1993). Sufism. In *History of Islamic Philosophy*. (L. Sherrard & P. Sherrard, Trans.). London; New York: Kegan Paul International; London: In association with Islamic Publications for the Institute of Ismaili Studies.

During, J. (2003). Cultural texture. In *La Music Iranienne: Tradition et evolution*. (S. Fazaeli, Trans.). Tehran: Toos Publishers. (Original work published 1984).

Farhat, H. (1990). *Dastgah Concept in Persian Music*. Cambridge: Cambridge University Press.

Halwward, P. (2003). Subject and Event. In *Badiou: a subject to truth*. Minneapolis: University of Minnesota Press.

Khaleghi, R. (2002). *The Theory of Persian music*. Tehran: Mahoor Institute of Culture and Art.

Maraghi, A. (2009). *Jame El-Alhan*. (B. Khazrai, Eds.). Tehran: Honar Publishers.

Maref, A (2004). *A Commentary on Safi Ad-Din Ormavi`s Adwar*. (A. Mousavi, Eds.). Tehran: Islamic Culture and Art Research Institue.

Milani, A. (2004). Tazkarat Al-Olia and Modernity. In *Modernity and Its Foes in Iran*. Tehran: Atiyeh Press.

Nasr, H. (2003). Art in The Modern West, In *A Young Moslem`s Guide to the Modern World*. Chicago: The Library of Islam.

Neirhaus, G. (2009). Markov Models. In *Algorithmic Composition: Paradigms of Automated Music Generation*. Germany: Springer Wien New York.

Nettl, B. (2009). *The Radif of Persian Music*. (A. Shadkam, Trans.). Tehran: Soreh Mehr. (Original work published 1987).

Plot summary of The Music of Chance. (n.d.). In *Wikipedia*. From http://en.wikipedia.org/wiki/The_Music_of_Chance

Rojas, R. (1996). Threshold Logic. In *Neural Networks: A Systematic Introduction*. Berlin: Springer.

Safvat, D. (2010). *Eight Articles on Philosophy of Music*. Tehran: Nik Publishers.

Safvat, D. & Caron, N. (2009). Forms in Iranian music. In *Iranian National Music*. (S. Salimzadeh, Trans.) Tehran: Nik Publishers. (Original work published 1966).

Tahmasbi, A. (2001). *Exploring Rhythm Through Words*. Tehran: Mahoor institute of Culture and Art.

Talai, D. (2006). *Radif of Mirza Abdollah, pedagogical and analytic notation*. Tehran: Ney Publishers.

The Cancer Cell. (n.d.). In *Cancer Research UK*. from http://www.cancerresearchuk.org/cancer-help/about-cancer/what-is-cancer/cells/the-cancer-cell

Wishart, T. (1994). Pitch. In *Audible Design: A Plain and Easy Introduction to Practical Sound Composition*. Yorkshire: Orpheus the Pantomime Ltd.