MUSIC AND SPACE

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SUMMARY. The present study proposes an insight of the use of space by composers worldwide during several centuries. From the first appearances dated in the Renaissance period until our days, space has been used in a many ways and this aspect inspired composers from all the important periods of time. From Giovanni Gabrieli to Beethoven or Mozart, from Mahler to Henry Brant or Kurtág, each composer exploited space in many ways in order to harness their visions on both programmatic and concrete music. In our days, a very important role in the development process of spatialized music is given to the electro-acoustic trend which expanded in many ways throughout the important studios in Europe and United States. Other important features in this field of music is the sound scaping trend. Numerous artists are looking to extract as much possible from a specific space by recording or exploiting its acoustics and aural architecture.

Keywords: spatialization, sound, placement.

The way in which modern and contemporary composers are using space as a musical parameter is constantly developing in our days. This particularity is in some cases a strong link between music and other arts.

A solid starting point concerns the term of spatialized music as a composing aspect. On the other hand, the semantic of the word *space* is also very important. This term is strongly extrapolated in music or other important domains like mathematics, philosophy, architecture, and so on. The entire study outlines three acceptations of space: the **real** space, the **imaginary** space and the **feeling** of the space.

The use of space as a musical parameter involves very complex aspects that are hard to define. The technical performance act, the musical material, the general aesthetics and the placement of the sound sources have to be very well related in order to be guided towards a logical sense and or structure. The ideal situation in which spatialized music can be

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created needs an ideal acoustic and aural architecture. The placement of the audience is also a very important aspect; but if we look at modern concert halls architecture, we can observe the opposite. Usually the stage is placed in the middle of the hall land the audience surrounds it.

New music in new spaces is a long-term project in which I want to organize a series of concerts with spatialized music, interdisciplinary applications or electro-acoustic installations. This project aims to promote both contemporary music and visual arts. Architecture can be a simple witness of the artistic performance, but it can also be a reason or a co-author of this desideratum.

The strategies applied during the composing process usually have a different acoustic result than planned: the composer is always in the situation of thinking on how different ideas created during the writing process can sound. This aspect concerns many parameters: the temporal aspect, timbre (traditional or non-conventional effects), acoustics, and so on. When composers use space as a musical parameter things become even more complex. When you are writing for a church you must take in plan the reverberation, if you write for a non-conventional area, like a business building atrium, you must consider thinking about the background noise present in that space.

For a better understanding of creating music under these circumstances, we consider very important to put in order notions of the physic, acoustic and psychological parameters. However, the historical part could not be neglected. The first documented examples date back to the Renaissance period where the polyphonic technique and the echo effects suggested by the polyphony developed in many ways with or without the aspect of spatialization. The Venetian school with its important creators has an important role in the evolution of spatialized music (in instrumental or electro-acoustic music). In the next centuries, the space was used in various orchestral works by placing one or a group of performers offstage, away from the main ensemble. The reason was in many situations, for programmatic purposes[2].

A very unique and important centre of our days where sound combines with space is a summer academy that takes place in Fontainebleau. Here, every July musicians and architects meet and create different conceptual and applicative projects that reveal how interconnected are music and architecture. For a period of four weeks' composers, performers and architects meet and discuss how music and architecture can work together in creating or enhancing various buildings, squares or installations.

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[2] Ludwig van Beethoven –*Leonore overture*, Gustav Mahler- *Symphony nr. 1*, Béla Bartók – *The Bluebeard's castle*, Charles Ives - *The unanswered question*, Toshio Hosokawa – *Horn Concerto,* György Kurtág- *...quasi una fantasia* for orchestra, etc.

The IRCAM also manifests an outstanding interest for spatialization in different ways. Starting from the strategies of placing speakers or performers (or how many) in the performance area, to the complex spatialization software's and tools created by IRCAM in collaboration with MAX[3], the Parisian institute is an important research centre regarding this aspect.

Anatol Vieru judged the technique of spatialization like being a „gross spatialization, strictly sensory". The simultaneity of various sound events with different dynamics (an extensive *crescendo* with an extensive *diminuendo*) produce the impression of movement in space. When one amplifies, the other things, resulting in a simultaneous movement of approach or distancing.

If we refer to an architect point of view, we can observe the importance of analysing its aural characteristics. In the study named *Spaces speak, are you listening?* Barry Blesser and Linda Ruth Salter[4] point out the importance of both aural and acoustic architecture: „We may experience a train station as lonely and forbidding independent of its actual appearance. The acoustic of a grand cathedral can create an exalted mood; those of an elevator can produce the feeling of encapsulation and in the extreme, claustrophobia. The acoustics of an open area can produce feelings of either freedom or insecurity. Aural architecture can also have a social meaning. For example, the bare marble floors and walls of an office lobby announce the arrival of visitors by the resounding echoes of their footsteps. In contrast, think carpeting, upholstered furniture, and heavy draperies, all of which suppress incident or reflected sounds, would mute that announcement. The aural architecture of the lobby thus determines whether entering is a public or private event.[5]"

Since the early thirties, Edgar Varèse indicated in the score the way in which he wanted the performers to be located. Iannis Xenakis and Karlheinz Stockhausen implemented the idea of placing the performers between the audience. Things evolved with the appearance of the speakers, radio or television. An important landmark regarding this issue is the multimedia performance of Varèses *Poème electronique* from the year 1958, at the Philips pavilion within the Brussels exhibition where he used an impressive amount of speakers and metronomes.

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[3] MAX-MSP is a visual programming language for music and multimedia developed and maintained by San Francisco- based Software Company Cycling '74. During it's history it has been used by composers, performers, software designers, researchers and artists to create recordings, performances and installations.

[4] British researchers.

[5] Blesser Barry, Linda-Ruth Salter*, Spaces Speak, Are you listening? Experiencing Aural Architecture*, Cambridge, Mass: MIT Press, 2007, pg.3.

Image 1
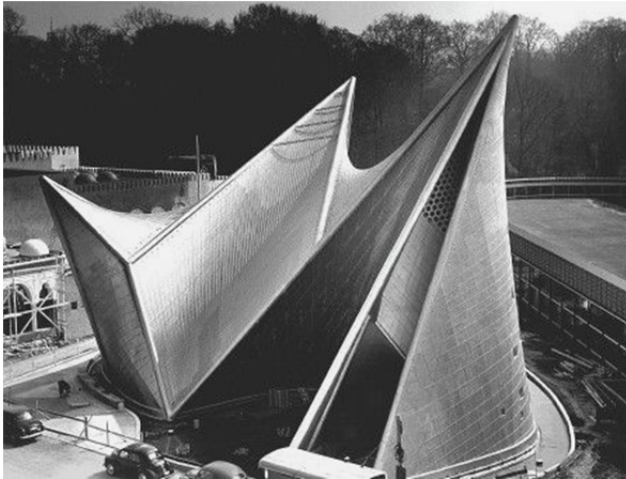
The Philips pavilion

The use of speakers became common, not just for being used like an independent sound source, but also like accompanists for soloists or different ensembles (the so called "tape music" carefully prepared in the studios and noted in the score) or even possibilities in which the performers use live electronics or interactive software that use real time processing. If we specify the common use of sound sources – the human voice, instruments and later, the speakers – we could record an important amount of possibilities of placing the sound sources in the spatial ambient. Thus, performers can be placed either on the stage or be organized in different groups. Another case would be placing them between the audience. In both cases, we can choose to indicate static performers or to create various movement scenarios both on the stage and far from it.

The Renaissance period kept this tradition in the polyphonic choir singing using two choirs using the *concertino-ripieno* relation. It is not known exactly the period in which this choir separation was invented. The principle of separation between the vocal groups dates undoubtedly from ancient times. From a musicology point of view, they were recorded starting with the XVth century. The bridal ceremony between the Lord Constanzo Sforza[6] and Camilla di Aragona was honoured by a series of works created for two choirs. The earliest creators of polychoral works where not well-

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[6] Lord of the regions of Pesaro and Gradara between 1474-1483.

known composers. Francesco Patavino and Ruffino d'Assisi where the first to cultivate this style based on spatialization.

The popularity of this technique is attributed to the Venetian School founded by the Flemish composer Adrian Willaert[7] which became chapel maestro of the San Marco Chapel in the year 1527. Unlike Patavino's music, the psalm technique of Willaert is significantly conservative. The polyphonic element is missing and the alert alternation of the choirs is rarely present. He considered that harmony should be more important than polyphony. As well he wanted a natural connection between the harmony and polyphony elements. The spread of polychoral music was relatively low, perhaps because of the ceremonial character of the music at that time. Another possible factor could be the space itself because the compositions where written mostly for specific spaces.

The spatial vision was relieved by the cross form architecture of the San Marco Cathedral, unique at that time. The interior reveals a series of balconies for choirs and two organs ordered separately. The spacious interior of the building with its multiple choir lofts was the inspiration for the development of the Venetian polychoral style among the composers appointed maestro di cappella at the choir of St. Mark's.

Image 2
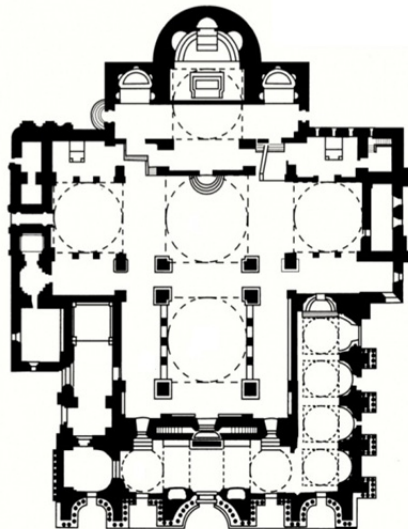
The San Marco Cathedral plan

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[7] Dutch composer (1490-1562) considered the inventor of the polychoral writing.

The composers started to harness this length between groups using the spatial separation as a special effect. However, this fact doesn't show that the division of the choirs represent an essential element of the Venetian music. Historical recordings suggest that this technique was used occasionally on special events.

From the beginning of the 7th century the Venetian School music developed in more than a simple alternation of two choirs by adding more vocal or instrumental groups. The descendants of Adrian Willaert composed large scale works for multiple groups. Usually, the composers choose to position the main choir behind the altar, the instrumental groups in inconspicuous locations like the organ lofts while the smaller choirs where placed in other locations, far from the main choir. These assumptions where exposed after studying a series of scores of that time. Other composers that suggested spatialization trough their writing where Orlando di Lasso, Thomas Tallis, Giovanni Pierluigi da Palestrina, Tomas Luis de Victoria, Jacob Handl, etc. If we refer to spatial instrumental works, we cannot overlook an outstanding engineering work like the Saint Stephen's Cathedral organ from Passau. This instrument was built and developed during a period of 250 years. During it's construction, the acoustical possibilities have developed significantly by adding registers in several places of the cathedral. Currently the instrument is made of 5 different instruments that can be operated from the main console with 5 manuals placed near the main organ. [8]

Image 3

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[8] Picture reference: *http://www.eberhard-geier.de/padomdispall-en.htm*
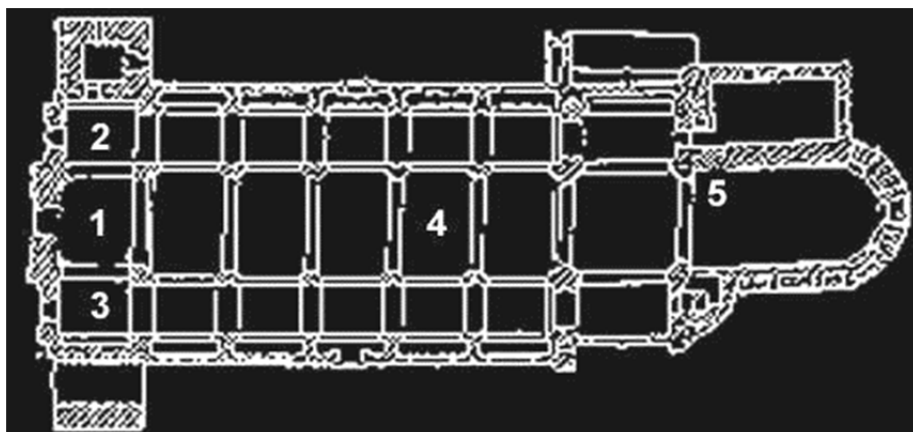
The plan of the organ:

1. The main organ;
2. "Evanghelien" organ;
3. "Epistel" organ;
4. Echo organ;
5. Choir organ.

Although this instrument has an enormous amount of timbre and spatial acoustic possibilities there concern for this aspect is not documented in writings or compositions. A series of composers written works especially for this instrument but spatialization didn't represent an important element of their works.

In the opera field, the exploitation of the stage space is naturally element in which the dramatic thread is enhanced simply by the placement of the characters. The remoteness and proximity sensations can be made with simplicity without using any kind of special effects. The placement of the soloists or the choir shape easily the spatialization effect. In the opera *Tannhäuser,* Richard Wagner refers to different spatial effects by using a group of brass players offstage or the movement of the choir during the return scene of the pilgrims. The approach and remoteness effect is made easily by the movement of the choir on the stage.

E.g. 1

(translation: from far away, slowly approaching the stage)

Over the next centuries spatialization was used rather rarely than constantly. Reference examples that can be remembered are the antiphonal effects from the St Matthew's Passion by Johan Sebastian Bach, *Notturno* in D major KW. 286 for four orchestral groups by Wolfgang Amadeus Mozart, the Leonore Overture by Ludwig van Beethoven, Gustav Mahler- the 1st and 3rd Symphony Bartok's Bluebeard's Castle or Charles Ives's Unanswered question. During the Romantic period composers used rarely spatial effects, mostly for enhancing the programmatic element. An important example relies in the requiem written by Hector Berlioz. Although he catalogued the use of space as a musical parameter as an "architectural music", the placement he proposed served clearly the dramaturgy because the spatial element wasn't used frequently in the score.

During the first part of the XXth century space was used in order to create a different perspective by creating contrast when using dispersed performers or offstage instrumentalists in orchestral music. Gustav Mahler used often off-stage instruments in his orchestral writing like the brass players from the 5th movement from the 2nd Symphony (1894) or the small drum from the 3rd Symphony (1896). This particularity attracted the attention of many personalities like Clytus Gottwald[9], Doonald Mitchell[10], György Ligeti and others.

Donald Mitchell stated that Mahler's tendency for spatialized music was influenced by Hector Berlioz's music. Mahler was aware of the spatial effect of the sounds that surrounded him in everyday life, another fact that lead him trough his concept of the use of space in his works. Other important composers of that time used similar effects but not that consequent like Mahler. Igor Stravinsky indicated the positioning of the tuba in his score of the Firebird ballet (1910). Richard Strauss used instrumentalists on the scene in his opera Die Frau ohne Schatten (1919). This period generated a series of revolutionary movements in European music and the use of space was a small but important element that shaped the afterwards of electroacoustic music.

Over the next decades the spatial issue was seriously developed by the electroacoustic music trend. The *acousmatic* followers treated in an extended manner spatialization by creating synthesis applications that altered the space spectrum. The actual trends in electroacoustic music concerns the use of the MAX software. Research institutes worldwide use MAX-MSP® to create and develop virtual vices that can be used in recordings or live performances or installations.

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[9] German composer and musicologist.
[10] British musicologist known for his writings on Mahler.

For example, the *Spatialisateur* (ab. Spat) developed by IRCAM can modify in real time the position of the sound source, can recreate acoustic environments, spatial trajectories, calibrate speakers and so on. [11]

Image 4

The collaborations between composers and architects opened new ways in the concept of installations, spatialized music and the extent of the actual space in which musical events are taking place. Karlheinz Stockhausen realized in 1956 in Osaka the music for a spherical construction.

Image 5
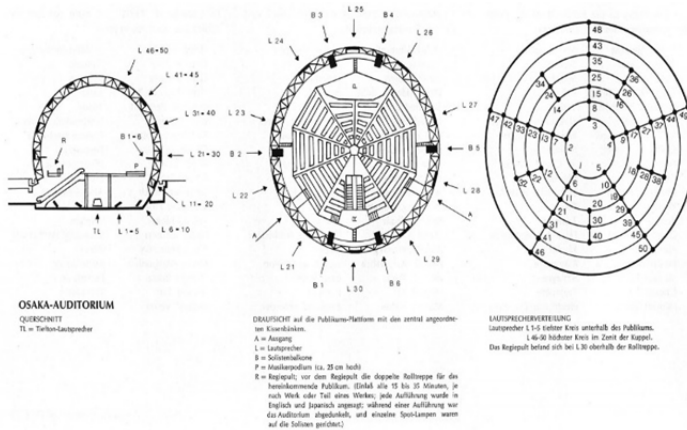
The plan of the site

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[11] Source : *http://www.fluxhome.com/products/plug_ins/ircam_spat-v3*

The audience was placed on a transparent platform located in the centre of the sphere. The sound sources where placed in a formation of 7 circles and 10 columns on the entire circumference of the sphere. Different sound patterns where triggered and sent to the speakers generating various trajectories using the polyphonic parameter.

The modern composers did not give up writing spatial music even for voice or instruments. Probably the most important composer in this field is Henry Dreyfuss Brant (1913-2008). With a creation that consists in over 100 spatial works, Henry's style is characterized by a very large use of polyphonic polyrhythmic and textural language. He is also an author with interesting decisions in creating large ensembles like the work *Orbits* for 80 trombones, organ and singer or *Flight Over a Global Map* for 100 trumpets, percussion and piano.
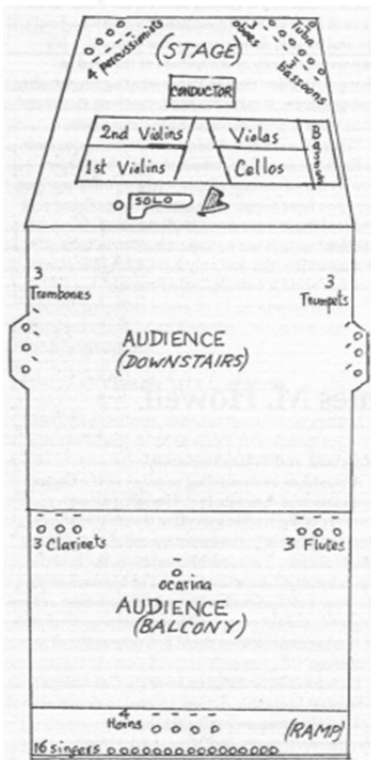
Image 6

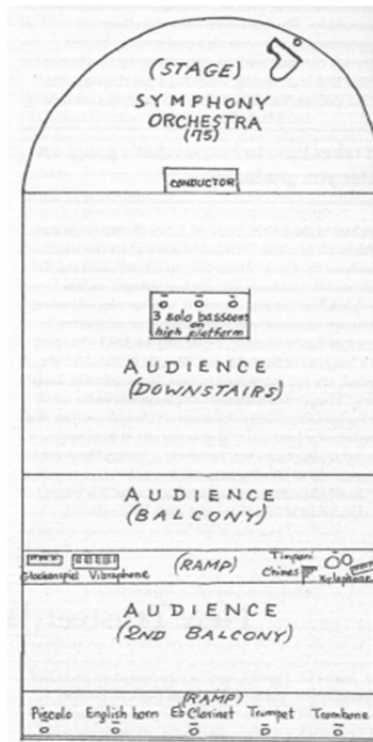Figure 1: Spatial plan for Spatial Piano Concerto.

Figure 2: Spatial plan for Antiphonal Responses.

The first page with the spatialization plan of the Piano Concerto

His conception about spatial music states that space exerts various influences on harmony, polyphony, texture and timbre. He calls space "the fourth dimension" of music. Also, he exploits timbre a lot by using usually instruments from a single family in his compositions. (*Ghosts and Gargoyles* for 9 flutes, *Orbits* for 80 trombones and so on).

In a report released in 1978 he states that „New concert halls continue to be built much like old ones, with the fixed seats and stage area which severely inhibit the variety and flexibility of musical space plans. The concept of a hall specifically designed to accommodate the spatial music of the past, present and future, a space with moveable walls, floors and ceiling, is still a project for the future."[12] Heathcote Statham[13] also criticized the trend of building halls in a circular form. „An audience, to use a proverbial expression, likes to" face the music"; with a circular hall it is almost impossible to arrange this for all of them".[14]

Another aspect o spatial music can be found in the concept of sound scaping. We can define it as a sound or a combination of sounds that emerge from various environments. It is firstly theorized in the XXth century as a need for researching the relation between the sound and the environment. This field defines a complex system where the sound, the place and the culture are treated in a dynamic relation with the human activities. The life and vitality of a certain space are experienced trough a listening exercise and trough the capacity of a human to build a sense or an interior feeling of that space – a sensibility of that space.

The contribution brought by visual artists reveals an impressive number of installations that are covering several social and cultural aspects. For example Louise Wilson[15] targets the philosophical parameters that refer to the spatial and temporal physics of certain styles and the way people perceive them.

Translated by Alexandru-Ștefan Murariu

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[12] Henry Brant, *Spatial music progress report*, a presentation of his experiments and visions, 1978

[13] British architect and music critic.

[14] Heathcote Statham, *The structure and Arrangement of Concert Halls,* Proceedings of the Musical Association, 28yh Sess. (1911-1912) pp. 72. *http://www.jstor.org/stable/961514*.

[15] British researcher.

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