



## SOUNDS AND COMPUTER – ARTISTIC MESSAGE

Paper/Presentation

**Topic: Music**

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### **Abstract**

Since the end of the 20th century, experimental techniques of sound generation have become the basis for composing the new intermedial creative music. A musical work in which the composer, in order to create the artefact, includes computer systems as an additional medium of distribution may be recognised as an artistic product of generative music. Computer software and specialised electronic devices enable the creation of a composition which is not only a strictly musical one but also an intermedial one, constituting a so-called "media hybrid". The analysis and interpretation of a conceptual work of art requires, on the one hand, a study of the software and, on the other, an assessment of its axiological values.

The speech will focus on presentation of partly improvised compositions by contemporary Polish composers – Krzysztof Knittel and Agnieszka Stulgńska – in which the sound is generated live from various media and is transformed by the computer. For the work free for(m) macwin2 (2012), Knittel used electronic sound generators, i.e. the ISA infrared programmable harp which detects body movements, as well as the iPhone and iPad. Stulgńska, in turn, in her composition Three Women for three women and 10 instruments (2017), makes use of the Polesie (a region in eastern Poland and the Ukraine) folk music and the sounds of traditional instruments besides various realistic effects which are subject to electronic transformation in real time. In the score, the composer additionally described the non-musical parameters of the intermedial discourse, including the scenery and lighting. The two compositions create a spectacle of a kind, which uncovers the symbolic meaning of sound emission that interacts with body gestures, visualisation or another electronic medium, thus creating an integrated artistic message.

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**Key words:** *contemporary polish music, intermediality, generative music, media hybrid, body movement*

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## **Sounds and Computer – Artistic Message**

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Since the end of the 20<sup>th</sup> century experimental techniques of sound generation have become the basis for composing the new intermedial creative music. A musical work in which the composer, in order to create the artefact, includes computer systems as an additional medium of distribution may be recognised as an artistic product of generative music. Computer software and specialised electronic devices enable the creation of a composition which is not only a strictly musical one but also an intermedial one, constituting a so-called "media hybrid". The analysis and interpretation of a conceptual work of art requires, on the one hand, a study of the software and, on the other, an assessment of its axiological values.

The paper will focus on presentation of partly improvised compositions by contemporary Polish composers – Krzysztof Knittel and Agnieszka Stulgńska – in which the sound is generated live from various media and is transformed by the computer. For the work *free for(m) macwin2* (2012), Knittel used electronic sound generators, i.e. the ISA infra-red programmable harp which detects body movements, as well as the iPhone and iPad. Stulgńska, in turn, in her composition *Three Women* for three women and 10 instruments (2017), makes use of the Polesie (a region in eastern Poland and Ukraine) folk music and the sounds of traditional instruments besides various realistic effects which are subject to electronic transformation in real time. In the score, the composer additionally described the non-musical parameters of the intermedial discourse, including the scenery and lighting. The two compositions create a spectacle of a kind, which uncovers the symbolic meaning of sound emission that interacts with body gestures, visualisation or another electronic medium, thus creating an integrated artistic message.

## 1. Introduction

Intermedial creative music as an example of generative art is becoming more and more popular among contemporary composers. This phenomenon is encouraged not only by well-developed transfer of new media theory to *software studies* but also by the transfer of traditional stylistic trends into technological context. The composer, moving across the advanced algorithmic optics does not limit his/her creation merely to abstract artefact. Musical work, for the creation of which the composer incorporates modern tools and computer systems as additional distribution medium may be viewed as artistic product of generative art, which is also characterized by high aesthetic value. Digital technologies which were made use of in the act of artistic creation make it possible to compose a final product which "is brought into being as a result of decisions progressively made by the designers, who are simultaneously willing to accept spontaneous, intuitive and »non-programmed« modification" [13]. The artist becomes a creator of hybrid discourse making use of such innovative techniques as *live electronic music*, *electronic media art*, *digital art* and *new media art*.

The most popular environment and language of programming in Poland dedicated to synthesizing and processing sound in real time and to algorithmic composition is SuperCollider, Cubase, Max MSP and Ableton Live software, used also by Krzysztof Knittel and Agnieszka Stulgińska. These tools become specific sound generators. SuperCollider programming environment is made up of the server (*scsynth*) and the client (*sclang*) that communicate with each other by means of *Open Sound Control* communication protocol , which allows musical instruments or other multimedia devices to exchange data in real time.

Two contemporary compositions were chosen for the purpose of analysis and interpretation: *free for(m) macwin2* by K. Knittel and *Three Women* for three women and 10 instruments by A. Stulgińska. In both of these works sound is generated live by various media and processed with the use of computer. Those musical pieces also manifest the synthesis of different techniques and means of expression occurring in various types of art: music, choreography and theatre, constituting an intermedial work of art according to Dick Higgins.

It is worth pointing out here that intermediality is an interdisciplinary discourse which consists in synthesizing different ways of conveying information where media build up a new, integrated message. As a phenomenon of post-modern culture it constitutes one of the significant paradigms of contemporary comparative studies. The elements of broadly defined medium in case of discussed compositions are not only sound generators, i.e.: classical medium, electronic or digital medium but also elements of choreography and scenery of dance theatre.

## 2. Methodology

The compositions featuring elements of performance selected for analysis represent the type of artwork in which the phenomenon of intermediality is present. „Intermediality does not mean either a sum of various medial concessions or situating particular works in between media but rather integrating aesthetic concepts of particular media in the form of a new medial context" [10]. These works adopt methods of representation and creation of meanings from other media. In the interpretation of intermedial work the notion of hybridization and theory of intermediality by Werner Wolf appear to be fundamental. The theory assumes the presence of different interrelations between a given medium and other media, resulting in a case of multimediality, so called 'medial hybrids'.

Within the scope of intermediality theory, developed earlier by Steven Paul Scher, based on relations between music and literature, Wolf distinguishes between:

- "**intracompositional intermediality**", referring to the work in which more than one medium takes

part in the signification process, and their presence can be distinguished and quoted (*overt intermediality*) or it cannot be distinguished or quoted and is only implicit (*covert intermediality*), - **extracompositional intermediality**, which apart from intracompositional relations refers also to reflections on mutual relations between various media"[15].

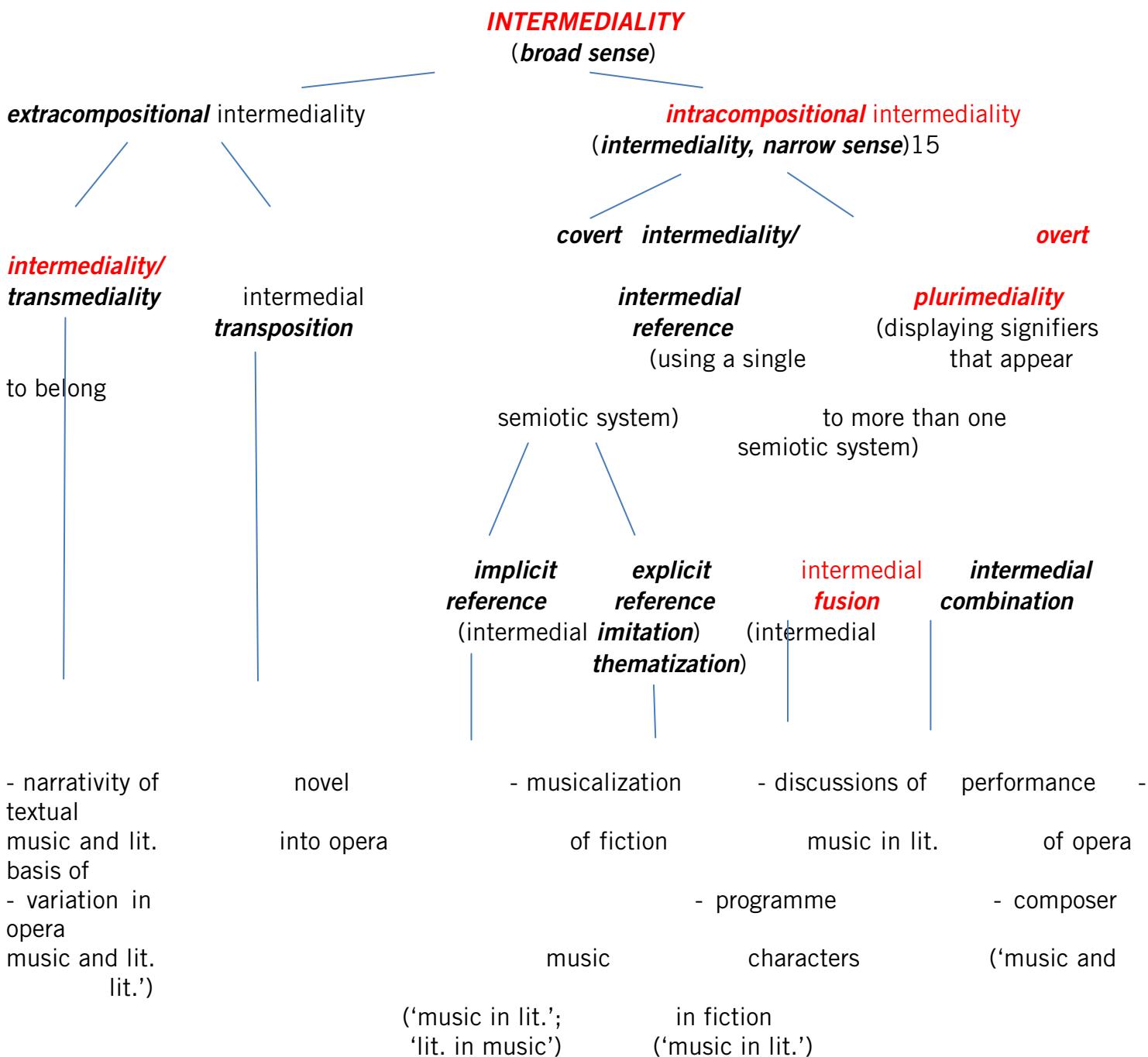


Figure 1. System of intermedial relations illustrated with musico-literary examples, Source: W. Wolf, *Intermediality Revisited Reflections on Word and Music Relations in the Context of a General Typology of Intermediality*, in: *Word and Music Studies: Essays in Honour of Steven Paul Scher and on Cultural Identity and the Musical Stage*, Amsterdam – New York 2002, p. 28.

Within the form of intracompositional intermediality the interactions between the given media (fusion, merging) may also be transferred to other media such as music theatre, ballet, comic book,

sound film, illustrated novels or opera, creating so called *new syncretistic medium* [16]. Discussed works are examples of fusion (see: *Figure 1*, notions marked red), where it is not possible to separate particular media from one another – they make up a uniform multimedia message. This conceptual fusion of different means of communication generates an intermedial interplay of music, theatre and choreography.

### **3. Generative music**

#### **3.1 Three Women for three women and 10 instruments**

Agnieszka Stulgińska's composition is an example of modern dance theatre, whose subject revolves around hardships of women's lives. Dramatic structure of this work is based on four scenes, depicting the title women in different situations (conductor, vocalist, flutist). Each of the women was assigned by the composer a different role to play in the music spectacle (sitting, singing, conducting, sifting grains, decanting water or stirring in the pots). These activities are closely related to the message contained in a particular folk song. In her work Stulgińska made use of authentic ceremonial folk songs from Polesie region (territory of Ukraine): in scene 1 a song entitled „Oj u w sadu sadu” is sung in white voice by the old and the young folk singer whereas in scene 3 they sing a song about a widow entitled “Oj szczo eto za werba”; the songs were an inspiration for the creation of the work. Scene 4 presents vocal improvisation of women with a-o-u-e phones generated for bass pulse, accompanied by white voice.

Musical piece turns into an original intermedial spectacle, in which spectators' attention is turned towards sounds generated by different sources but also to the elements of its scenery. The divisions in scene arrangement throughout the work are very clearly marked – the composer accentuates them by changing the intensity of scenery lighting (scene 1 – no lighting, scene 2 – the appearance of blurred light embracing the person of the conductor, then - the woman sitting on the floor who breaks up twigs, leaves and shells, puts them into a bowl and stirs, scene 3 – no lighting, just like scene 1, scene 4 – full lighting embracing three women: conductor and two women stirring beans, rice and cat wood chips in aluminium bowls to the specified rhythm) (*See: Photo 1*). The lighting, apart from creating interesting visual effects constitutes the form-shaping element of the musical work - it endows the content presented on stage with a distinct character, as in the theatrical performance. The absence of light "is in turn the psycho-acoustic element – it shifts the focus to listening to the voice from behind the wall and the sound from the small loudspeaker"<sup>1</sup>Throughout the whole scene sequence the changes take place also in terms of sound content, folk melody and the cast of performers.

Various media become the essence of the composition and their fusion results in complementary integrity and the final artistic result. The music created in this way is both generated live and reproduced from tape. Sounds produced by the instruments, props and by singing women are reinforced by microphones, which transmit the signals to the quadraphonic system and the small loudspeaker. The sounds of melosphere and sonisphere as well as electro-acoustic effects are transformed (mainly by the changes of frequency) by the computer software and then placed in space.

The way performers and loudspeakers are arranged on stage is also worth noticing. Stulgińska's

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<sup>1</sup> The information comes from a composer – Agnieszka Stulgińska

concept is to place the instrumentalists outside the stage but in such a way as to enable the conductor to maintain eye contact with the band. The female conductor and the women are on stage. The woman who sings using white voice moves across the adjacent rooms and the other one is to sit on the floor "like a little girl"[14]. In scene 4 all women are sitting on chairs forming a semi-circle surrounding the conductor (see: *Photo 1*).



*Photo 1. A. Stulgńska, Three Women for three women and 10 instruments, scene 4. Concert 27. Portraits of Composers 2017. Anna Karpowicz, Lilianna Krych, Marta Bogusławska-Grzywacz (photo by A. Stulgńska)*

The citation of particular media is possible only in case of witnessing a live performance of the spectacle or watching it in the form of video recording. The soundtrack alone does not convey the precise message inscribed by the conductor in the score. For the creation of polymedial musical form Stulgńska used the following media:

- classical medium: traditional instruments (string quintet, wooden and metal simtra, baritone saxophone, flute, white voice of the folk singer - Maniucha Bikont, and objects generating sounds of percussion: grains, bowls, dry leaves, twigs, pine cones and nut shells, water)
- electronic medium: tape with recorded white voice of an elderly woman - Dominika Czekun, singing folk melody from Stari Koni village in Polesie Równieńskie region (played from a small loudspeaker)
- digital medium: computer with Ableton Live software for processing the sounds made by human voice and instruments.
- theatrical medium - division into scenes, actors' performance, scenery with props
- medium of light - lighting of the scenery.

### 3.2 free for(m) macwin2

By contrast, Krzysztof Knittel's composition is computer-based music in which the intermedial artefact is created by sound generators built by Piotr Sych in Windows operating system, patch MaWe created by Marek Chołoniewski and Marcin Wierzbicki and designed on the basis of Max/MSP program and modern non-musical devices iPhone i iPad, with applications by Apple (See. Photo 2).



*Photo 2. Media in free for(m) macwin2 performance by K. Knittel during the concert being a part of Międzynarodowy Festiwal Muzyki Współczesnej [International Contemporary Music Festival] "Warszawska Jesień", 2012 (photo by K. Knittel)*

The device which deserves to be paid special attention to is the generator manufactured by Piotr Sych i.e: programmable ISA infra-red harp in the shape of a square frame plugged into the computer with creative digital tool - Cubase. This interactive instrument is made up of 32 invisible strings - infra-red beams, forming a grid. The device detects the movement of the hand or the body and by means of software generates pre-programmed sound bases and visualisation integrated with signals.

The performer by generating movement within the framework of the harp may switch on several functions in the instrument, e.g: intensity of sound, tempo of the musical piece or sound distribution in quadraphonic system.

The application of Sych's instrument in the composition allows to join the elements of performer's movements with the music. The author of movement choreography in real time music creates music with movement artefact.

The discussed work of Knittel is the example of intermedial work of art in which the addressee has the opportunity to freely follow the correspondence between the creators representing different art disciplines (music, choreography or conducting).

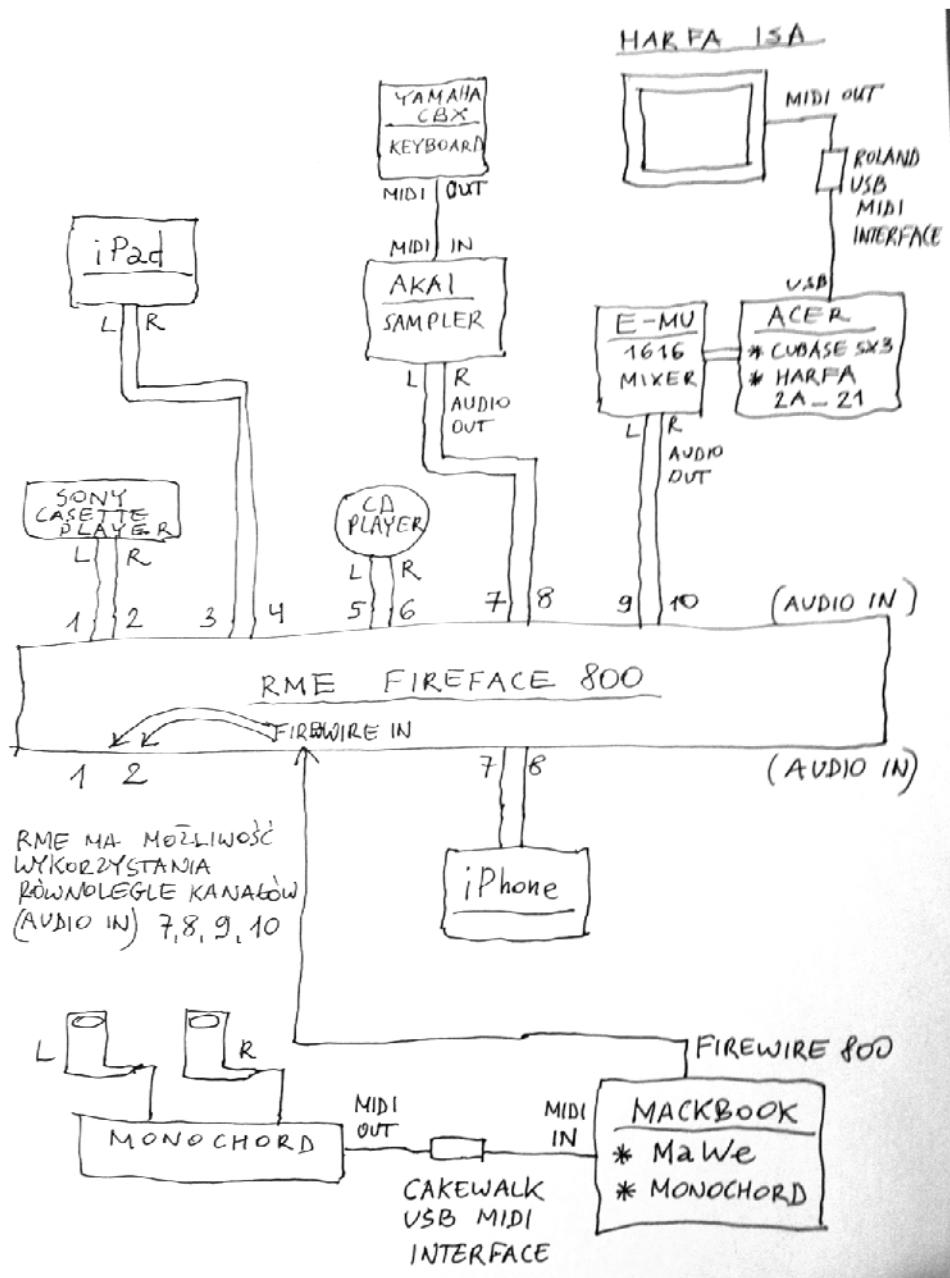
Knittel, in order to create an intermedial spectacle, used the following media in his musical performance:

- electronic media,
- digital media,
- choreography (body movements/hand movements while conducting) – playing ISA harp.

The composer himself was the creator of hand movement in the frame of the harp and he also controlled the equipment during the premiere performance.

The work does not have a traditional score; it is a freely improvised musical piece. The musical occurrences and technology of generating electro-acoustic effects are recorded in the form of graphics and text where along with their real timing there is a note on the type of electronic effects generator.

The composer also designed the instrument (equipment) layout, which should be followed while performing the composition. (See: *Figure 3*)



*Figure 3. Instrument layout - scheme by K.Knittel*

## 4. Artistic Message

### 4.1 Body movement as a music-generating factor

In the context of discussed musical works the computer is incorporated into the process of improvisation and creation of the generative art work. Computer software then "interprets the performance of the work and displays variable response depending on the input signal and programmed operating rules, modifying the course of music generation or changing parameters of sound transformation" [2].

Body movement also plays a major role in the discussed works, where, being a part of scenery, on the one hand it manifests emotions and expression encoded in the musical work and on the other becomes a music generating factor.

What deserves special mention in both discussed works is the activity of conducting, applied in a non-traditional manner.

In the composition *Three women* the composer assigned the conductor a symbolic function; she becomes one of the characters of intermedial performance, inspired by the narrative written in the lyrics of the folk song. Besides coordinating the performers she improvises gestures to accompany the voices of the women and musicians (circular, straight and sharp movements) and participates in the spectacle. In scene 2 the conductor's gestures (Wom. 2) are further repeated by the woman sitting on the floor (Wom. 1), who stirs the contents of the bowl with her left hand and with her right hand mimics the conductor's gestures (See: Figure 4). Hand movements of both women become additional elements of choreography. In the composition there are also extracts where the composer precisely transcribed the conductor's movements, which should be synchronised with the band and sounds or subjugated to the shapes of sounds.



Figure 4. A. Stulginska, *Three Women* for three women and 10 instruments, scene 2, t. 45-44

In scene 2, as it is explained in the commentary to the composition, "the conductor manifests the whole spectrum of intelligence and control, pursuit of the inner song and transformation" [14].

Another element which is worth highlighting in this scene is the improvised singing of one of the

women and drawing the shapes of the orchard, flowers and garden - interpreting in this way the song from Polesie region.

The element of hand movement in Knittel's work, which may be identified as the movement of conducting the music played from the equipment, are the composer's gestures inside the frame of ISA harp. The composer apart from generating sound in real time simultaneously becomes the participant of the spectacle.

*The final result Free for(m) macwin2* in turn became an inspiration to create movement composition. Here we witness a process which is opposite to the one put forward by the composer. For the interpretation Anna Galikowska-Gajewska selected the extracts of the work which were created as an outcome of using ISA harp by Knittel. One of such fragments is the extract timed 6'00"-7'30", in which sound objects are generated by monochord and ISA harp. Sound effects intended to be created in Knittel's concept are the sounds made by helicopter, flutes and wood. If the movement composition created by the author of choreography had been used in Knittel's work a new outcome in terms of sound would have been produced, connecting two intuitive approaches to the process of creation.

#### **4.2.1 Movement interpretation of musical piece – artistic form of Dalcroze's method – origin, tradition, present day**

The author's idea of movement interpretation of the musical work in question springs from Dalcroze's concept of reflecting music in movement.

At the beginning of the 20<sup>th</sup> century Emil Jaques-Dalcroze - a prominent pedagogue, gifted musician, sensitive and generally talented person, created the Eurythmics method, which is based on movement resulting from music.

Eurythmics method consists of 3 interconnected links: Eurhythmics with *plastique animée*, Solfège and Improvisation.

Eurhythmics is the basis of the method: 'It is a form of musical education, based in the first place on listening and teaching of movement [...] [12]. Eurhythmics, with its sources in rhythmic and movement exercises, simultaneously trains and develops many different skills and dispositions.

Solfège is a reinvention of traditional ear training and sight singing, which develops an integrated and expressive understanding of pitch, scale, and tonality through activities emphasizing immediate aural comprehension and vocal improvisation.

Improvisation is an expression of an understanding of musical concepts, form and meaning through spontaneous musical creation using movement, voice, and instruments. Improvisation gives the opportunity for music and movement creation. Improvisation is the basis of Dalcroze's method. Its importance is certified by the words of F. Marin "Improvisation is the basis, nothing more and nothing less" [3].

Emil Jaques-Dalcroze also developed his own art form - initially called by its creator — *plastique animée*<sup>2</sup>.

*Plastique animée*, called nowadays the movement expression, is a crucial element of movement interpretation of music, which builds the artistic dimension of the Eurhythmics Method. The

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<sup>2</sup> *Plastique animée* — a definition introduced by Emile Jaques-Dalcroze himself. It is currently included in the Polish curricula under the name of 'Technique and movement expression' or 'Exercises in movement expression', see E. Jaques-Dalcroze, Selected writings, pp. 63–84.

essence of the movement interpretation of music is a close relation between music and movement.

“Three elements of Eurhythmics intertwine and supplement one another, creating a multifaceted system of music education granting the access to the world of music, its exploration and experiencing it in motion. The uniqueness of Eurhythmics is to be perceived also in the context of its comprehensive impact on the human activity, in the physical, psychological and mental sphere” [11].

According to the author of this article: “The Dalcroze method of teaching music is based on the assumption of comprehensive human development in numerous spheres. Movement being the basis of the Rhythmics leads to harmonious progress of the whole human organism” [6].

The origin of the method is very well explained by Dalcroze himself: “I dream about such system of teaching music in which the human body will be playing a direct role between the sound and the thought, it will simply become an instrument of expressing our sensations” [3].

Furthermore, the creator's interest in ancient Greece's legacy contributed greatly to the creation of the method. Emile Jaques-Dalcroze reached for the legacy of the Greek culture, whose noble ideas of education and shaping people's hearts, bodies, and minds became an unattainable ideal for many generations of creators. The most conspicuous reflection of this was Dalcroze's fascination with Greek sculptures. He had been studying the construction of Greek sculptures from which he extracted 20 gestures, subsequently applied to plastique animée. Simultaneously, Dalcroze was trying to find a kind of movement that was not just movement for movement's sake. This movement should be subjected to music and follow it to cause ‘[...] the body to become music’ – he used to say [8].

In the first movement interpretations the Eurhythmics creator revives 20 gestures. Hence in Hellerau<sup>3</sup> Emil Jaques – Dalcroze staged Gluck's opera 'Orpheus' (the second act in 1911 and the

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<sup>3</sup> Institute in Hellerau was founded by German brothers Dorn for Emile Jaques-Dalcroze. Hellerau, which was a garden city, is now a European centre for teaching and performing according to the guidelines of the Eurythmics Method.

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entire work in 1912). Janina Mieczyńska – Lewkowska, a Dalcroze's student, when describing this event, said: "It was an amazing show. In one time and one place resounded music conducted by Dalcroze, musical movement picture, choreography was presented by a great team of performers

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who followed the example of ancient Greek players clothed with tunics; movement and lights were closely related to each other” [9].

Music is the epicentre of all activities undertaken within the scope of Dalcroze's method. Dalcroze's words prove its utmost importance: “My whole system of education by rhythm is based on music, because music has a strong psychic force which, by its power of evoking action and then regulating it, can harmonise our whole being” [7]. The creator of Eurhythmics affirmed also that “Man is the most perfect of instruments and his body is the sensitive, dynamic instrument through which he can attain his highest potential” [7].

The essence of movement interpretation – art form, however, remains constant, perfectly expressed by Friedrich Schiller: “When the music reaches its noblest power, it becomes a shape in space” [1]. For what is interpretation but a moving shape of music presented as expressive movement of performers in space? In this creative form, the concrete dimension of music is realised by the human body in movement. The art of creating movement interpretations of music consists in continuous construction of relations between the music and the human body, between movement and space. It is this perspective and the personal store of experiences that affect how an individual understands and defines the discussed subject. For the author of the article “Movement interpretations of a musical piece are the most beautiful and the most perfect way of reflecting music by means of spatial-movement measures. They constitute the synthesis of music and movement, thanks to which they allow a deeper experience of music that is embodied in the movement of the human body” [4].

The basis for creating movement interpretation is movement improvisation.

Performing improvised movements to the music, like every kind of improvisation (instrumental or vocal) “[...] leads to manifesting oneself, to a certain type of individualisation, allows one to get rid of inhibitions in terms of movements, stimulates the imagination, makes a person open for others and for the surrounding world” [5].

Props play an important role in the creation of movement interpretations, particularly those of contemporary music.

“The props can be used in movement interpretations in a number of various ways. They can be a kind of set design – decorations on the stage. The props include also stage costumes and various objects used to express the emotional character and expressiveness of music in movement. Lighting is an indispensable element of stage presentations as well. The range of the newest stage means of expression that we take advantage of nowadays when presenting movement interpretations on stage include multimedia presentations or more advanced animations and visualisations” [6].

Her wealth of experience in the field of creative activities within the scope of Dalcroze's method has finally made Anna GG convinced that contemporary music is her biggest inspiration. Its versatility resulting first and foremost from the richness of musical sound, offers enormous flexibility in creating and exploring original spatial and movement solutions. Contemporary music has a very strong impact on human imagination and is a great incentive for continuous exploration of movement, the limitations of which may result only from the anatomical features of the human body.

One result of the recent years of her strenuous artistic and research work related to contemporary music is a completed and published work of art: a DVD, a book and a photo album, published as a combined work under the title

*The sound in movement interpretation of a music piece. Debussy, Cage, Penderecki, Szalonek, Dobrowolski, Olczak, Kaiser.*

Anna GG for many years has been a specialist in creating choreography for contemporary music.

#### **4.2.2 The outline of creative concept in movement interpretation of Free for(m) macwin2 work by K. Knittel**

The musical work of Knittel, analysed above, or, more precisely, its extracts, posed a fresh challenge for the author. She was searching for movement qualities originating from diversified sounds generated by electronic media, digital media and sounds made by ISA harp. Anna GG - the creator of choreography as well as the performer, experimented in terms of making use of human body as a direct medium reflecting music and its expression. Rich, full-range sound of the musical work existing in multiple sound fields triggered off the use of multimedia to create movement visualization compatible with sonic image of the musical work.

The author's own creative concept is an individual suggestion making use of contemporary media - video recordings, visualizations of selected sound fields and movement performed live in the space on stage. The suggested artistic concept represents typical Dalcroze-like solutions referring to presenting music in movement and space, in which the movement expression of the performer is reinforced with modern media tools, giving it a new - intermedial dimension.

### **5. Conclusion**

This article is an attempt at demonstrating that computer, as a digital instrument, with a system different from traditional ones, which is "played" by the composer may be used to create a "generative" musical composition, in which the process as such is regarded as the primary medium of creative expression.

The analysed compositions create a specific polymedial spectacle, a performance original in its content and form of communication, which reveals symbolic meaning of sound emission, interacting with choreography, light, theatrical form and other electronic medium. The corporeal aspect, so meaningful for theatrical performance here also became one of the media, allowing the verbal communication as well as communicating by means of gestures, body and movement with the addressee.

Movement interpretation of a musical work fits perfectly into the contemporary discourse concerning polymedial spectacle. It constitutes another structural element of the multidimensional multimedia spectacle, endowing it with greater momentum and dynamism.

Body movement, along with other media may become, as in the discussed compositions, a generating factor of musical expression, gestures and also, through computer, of the musical matter - sounds.