



Research Article

UDC 78.036(470+571)

DOI: <https://doi.org/10.26176/mosconsv.2022.49.2.05>

Electroacoustic and Audiovisual Composition in the Work of Igor Kefalidis

Paulo C. Chagas

University of California, Riverside

900 University Ave, Riverside, CA 92521

paulo.chagas@ucr.edu[✉], ORCID: <https://orcid.org/0000-0003-1706-5508>

Abstract: On January 31, 2020, Igor Kefalidis presented a workshop and concerto focused on his works for video and electronics at EARS (Experimental Acoustics Research Studio), the centre I founded and direct at the University of California, Riverside, USA. The American students were impressed by his approach to audiovisual composition in which they were able to see elements of science fiction and futurism; two aesthetics that are major cultural references in Southern California, impacted by the cinema of Hollywood. On the basis of the works performed at that event, I will present my thoughts about the essence of the electroacoustic music and reflections on the meaning of Igor Kefalidis's creativity in this field of contemporary composition.

Keywords: Igor Kefalidis, electroacoustic music, audiovisual composition, “Wortlaut”, “Proobos”, “X2”, “Apophonie”, “S_S_S”, “TapeExt”, “Vega_S”

Acknowledgment: Stacia A. Raymond for English language revision

For citation: Chagas, Paulo C. 2022. “Electroacoustic and Audiovisual Composition in the Work of Igor Kefalidis.” *Nauchnyy vestnik Moskovskoy konservatorii / Journal of Moscow Conservatory* 13, no. 2 (June): 368–81. <https://doi.org/10.26176/mosconsv.2022.49.2.05>.

СОВРЕМЕННОЕ КОМПОЗИТОРСКОЕ ТВОРЧЕСТВО

Научная статья

Электроакустические и аудиовизуальные сочинения в творчестве Игоря Кефалиди

Паулу С. Шагас

Калифорнийский университет в Риверсайде (США)

900 University Ave, Riverside, CA 92521

paulo.chagas@ucr.edu[✉], ORCID: <https://orcid.org/0000-0003-1706-5508>

Аннотация: 31 января 2020 года Игорь Кефалиди провел семинар и концерт, посвященный своей музыке для видео и электроники, в EARS («Студии экспериментальных акустических исследований») — центре, который я основал и возглавляю в Калифорнийском университете в Риверсайде, США; семинар завершился концертом из сочинений российского музыканта. Американских студентов впечатлил подход Кефалиди к аудиовизуальной композиции, в которой они смогли увидеть элементы научной фантастики и футуризма; под влиянием эстетики голливудского кинематографа эти два жанра являются основными

культурными ориентирами в Южной Калифорнии. На основе анализа сочинений, вошедших в программу концерта, я изложу свои представления об электроакустической музыке и размышления о том, какой смысл несет работа Игоря Кефалиди в этой области современного композиторского творчества.

Ключевые слова: Игорь Кефалиди, электроакустическая музыка, аудиовизуальная композиция, “Wortlaut”, “Proobos”, “X2”, “Arophonie”, “S_S_S”, “TapeExt”, “Vega_S”

Благодарности: Благодарю Стейшу А. Раймонд за корректуру текста статьи.

Для цитирования: *Chagas Paulo C.* Electroacoustic and Audiovisual Composition in the Work of Igor Kefalidis // Научный вестник Московской консерватории. Том 13. Выпуск 2 (июнь 2022). С. 368–381. <https://doi.org/10.26176/mosconsv.2022.49.2.05>.

1. INTRODUCTION

In 1991, artistic director of the electronic studio of the WDR Radio Cologne York Höller introduced me to Igor Kefalidis, who had been invited to work on a Russian/German exchange project.

As a pioneering force in the world of electroacoustic music, Studio has come to represent an important historical turning point for its significant works and philosophy¹. Since its foundation in the early 1950s, the Cologne Studio has fostered intensive collaboration between artists, engineers and technicians, as well as promoted international exchanges.

Commissioned composers of the Cologne studio were not required to have previous knowledge in electronic music because it was understood they would benefit from the team of experts who assisted in production: a sound engineer, a sound technician, and a “sound director,” who was a combination of artistic and technical assistant. The mutual contacts and influences between composers and these key figures enriched the creative process and contributed to the originality of the musical works produced. During the ten years I worked there as sound director and composer-in-residence (1990–1999), I had the opportunity to participate in this dialogical structure, assisting distinguished composers including Karlheinz Stockhausen, Luc Ferrari, and Jonathan Harvey, and becoming familiar with different methods and techniques of electroacoustic music composition and production. I have described the collective structure of the electronic music studio of Cologne as “dialogical creation” [1]. The professional experience I acquired there motivated me to pursue scholarly research focused on a philosophical and critical account of the creativity of electroacoustic music.²

Igor was interested in the production methods of the studio and the new digital tools of the early 1990s, which marked an important transition from analog to digital in electroacoustic music. The Cologne studio developed a unique know-how with analog apparatuses which they had kept functioning in order to apply them in the new digital context. This hybridism contributed further to the pluralistic approach of the studio. In November 1991, I traveled to Russia for the first time to present my music in concert in Moscow and Voronezh and have returned many times since. Each visit has afforded me the privilege of

¹ The words “electronic” and “electroacoustic” are used here practically as synonyms. For a discussion between the difference between these terms, see [2, 103–158].

² My book “Unsayable Music: Six Essays on Musical Semiotics, Electroacoustic and Digital Music” [2] presents a reflection on the creativity of electroacoustic music and discuss the work of the Electronic Music Studio of Cologne in the 1990s.

meeting many wonderful musicians, artists, and citizens and I have enjoyed an enduring friendship with Igor Kefalidis. I quickly became fascinated with the vibrant musical life in Russia, the openness of Russian musicians, and their enormous interest in creativity and innovation. I have had the opportunity to hear Kefalidis' music performed live in concerts, as well as in presentations and personal meetings. Over the years, he has visited me many times in Cologne and California, where I moved in 2014. I have been following his compositional path and professional efforts to promote electroacoustic music in Moscow and Russia more broadly, especially through the creation of the Center for Electroacoustic Music (CEAMMC) at the Moscow Tchaikovsky Conservatory.

Kefalidis' profound interest in electroacoustic music has resulted in a long period of composing pieces exclusively with electroacoustic sounds — most in combination with solo instruments, chamber music, and orchestra. His creativity reaches into the fields of dance and audiovisual composition and the relationship between sound and image plays a crucial role in his recent work, in which he has been collaborating with visual artists. Most recently, he has been adopting new tools to create synthetical images. On January 31, 2020, Kefalidis presented a workshop and concerto focused on his works for video and electronics at EARS (Experimental Acoustics Research Studio), the center I founded and direct at the University of California, Riverside, USA. The American students were impressed by his approach to audiovisual composition in which they were able to see elements of science fiction and futurism; two aesthetics that are major cultural references in Southern California, impacted by the cinema of Hollywood. On the basis of the works presented at that event, I will examine and reflect on the foundations of electroacoustic music and audiovisual composition in Kefalidis' work.

2. ELECTROACOUSTIC MUSIC

What is electroacoustic music? From an evolutionary perspective, electroacoustic music represents a new paradigm in the history of music that carries on the tradition of vocal and instrumental music and extends it to include the use of apparatuses to produce and move sound around in spaces. From this historical point of view, it has emerged in a period of crisis represented by the disruption of the fundamental role tonal harmony has played as the established disciplinary matrix of music composition. This crisis triggered different responses leading to non-tonal textures in the music of composers such as Schoenberg, Webern, Stravinsky, Debussy, Bartok, Messiaen, and others. Moreover, it pushed composers to explore other constructive principles of musical organization focused on the physical reality of sound phenomena, and to emphasize sound qualities such as timbre and noise. Within the crisis of tonality as foundation, electroacoustic music was able to meet the demands of an aesthetic sensibility focused on this expanded consciousness of sound phenomena. We find three different orientations in the development of electroacoustic music: *musique concrète*, *elektronische Musik*, and computer music.

The *musique concrète* that came into existence in Paris after World War II, began with Pierre Schaeffer's experiments in recording techniques for capturing sounds of the acoustic environment. This approach engaged the persistent myth that the world is the primary acoustic space of music extending from the earth to the whole universe. The acoustic myth allows sound phenomenon to be isolated from the physical environment, be heard as a unique object and event, and eventually be disconnected from its material

source and origin. Released from its cultural references, sound becomes a self-referential paradigm for composing new audible forms. At this point, composition took advantage of new technology for recording, manipulating, and reproducing sound. Drawing ideas from Edmund Husserl's phenomenology of time consciousness [6], the aesthetics of *musique concrète* developed notions such as *sound object* and *reduced listening*. These categories emerged through the interaction of sound material with technical apparatuses, most notably, the tape recorder. *Musique concrète* provided electroacoustic composition with analytical and synthetic approaches to sound perception and composition.

The *elektronische Musik*, most closely associated with the electronic music studio of Cologne, pioneered the creation of sounds whose models are neither found in nature nor possess the qualities of instrumental or vocal sounds. Methods adopted by Karlheinz Stockhausen and other composers of *elektronische Musik* were used to invent new sounds building from the simple elements of technical apparatuses. The signal generator and the noise generator became the prototypes of electronic sound devices despite being designed to test equipment and not for making music. These apparatuses are both mathematical constructs; the signal generator explores the simplicity of a single harmonic motion such as the sine wave, while the noise generator explores the statistical model of all possible vibrations occurring randomly in auditive space. The aesthetics of *elektronische Musik* took advantage of electroacoustic technologies developed during the German Third Reich, which radically transformed the experience of listening while creating new logics to frame political activity. Radio broadcasting and sound amplification were interconnected technologies used for acoustic landscape control and organic synchronization of masses. Radio in particular activated the sonic experience of private intimacy and transformed the universe of telematic paradigm. However, radio also preserves the ancient magic of mythical worlds. As McLuhan notes, "The subliminal depths of radio are charged with the resonating echoes of tribal horns and antique drums" [7, 299].

The historical opposition between *musique concrète* and *elektronische Musik* is emblematic of the diversity of the electroacoustic paradigm. After World War II, the activity of cultural institutions such as the radio studios of Paris and Cologne, promoted a shift of consciousness in electroacoustic music composition. *Musique concrète* developed a poetics of *detachment* from the previous vocal and instrumental paradigms and *attachment* to the sound phenomenon; it disengaged sound consciousness from the models of traditional vocal and instrumental music while at the same time, moved toward interactions with sound that revealed cultural values and identities. Meanwhile, *elektronische Musik* developed a poetics of *detachment* from the sound and *attachment* to the paradigm of music composition. By carrying on the compositional path of the previous vocal and instrumental paradigms, it disentangled consciousness from the representative background of sound as a meaningful artifact and focused on the musical relevance of sound phenomenon. *Elektronische Musik* explores differentiations of acoustical agency in the vibration-centered model of sensitivity.

The *heterogeneity* of sound material is an aesthetic foundation of electroacoustic composition. The opposition between recorded sounds (*musique concrete*) and synthetic sounds (*elektronische Musik*), quickly dissipated as any kind of sound could become the object of musical composition. The electroacoustic paradigm not only integrated the musical puzzles of the previous vocal and instrumental paradigms but provided new ways for representing and manipulating sound. As the prototype of a reproduction

apparatus, the tape machine was able to radically transform and manipulate recorded sound despite the fact that electromagnetic tape symbolizes linear thinking. On the other hand, digital systems of audio recording introduced non-linear representation in which sound is broken down into an atomic dot-like structures that disintegrate into a mosaic of numbers as the bond with temporal sound tissue dissolves. The fragmented granular structure of the sound, which can be manipulated by computers and artificial intelligences, replaces linear thinking and promotes a consciousness of the microstructure of any given sound.

Digital systems such as samplers, programs, and storage devices stand as prototypes with the potential to project sound artificially, and thus, reinvent it. As Pousseur observed, electroacoustic music articulates a continuous interaction between different levels of sound organization, so that it becomes difficult “to draw a precise boundary between internal composition of sound and higher levels of composition” [8, 82]. A myriad of sound poetics emerged within the electroacoustic paradigm such as soundscape composition, deep listening, live-electronics, and other musical distinctions involving vocal, instrumental, or electronic sounds. The electroacoustic paradigm extended sound perception and consciousness, especially in the way it relates to microscopic and macroscopic levels of sonic composition. The opposition of macro/micro sound, along with the methodic use of music apparatuses, is a signature of the electroacoustic paradigm symbolizing a desire for intensification of the living experience.

Automaticity is another signature of the electroacoustic paradigm. The automation of processes is the mode of operation of apparatuses and *repetition* is a music signature that benefits from it. Electroacoustic music composition deals with the repetitive nature of apparatuses in different ways. On the one hand, it works against automaticity by seeking to intensify the affective experience with sound, as it is able to access the vibratory experience and directly address the body; for example, through low frequencies, noise, and spatial control of the acoustic environment. On the other hand, electroacoustic music composition embraces repetition and automaticity at the base level of sound composition. For example, the technique of the *loop* in the analog era was introduced as a tool for creating sounds with tape machines and used to repeat and build sound textures. A great deal of experimental and popular electronic music explores the loop as a signature of composition and the technique was further developed with the drum machine and the digital sequencer. In today's society, the automaticity of music apparatuses can be seen in the digital playlists of streaming services. The electroacoustic paradigm promotes the accumulation of sound and music objects such as sound archives, song collections, and repertoires of musical styles.

Techno is one such style that shows how electroacoustic music can match the automated nature of apparatuses by activating repeating events that account for the ritualization of models. These models are variations of the apparatuses' own programs that can affect the society in contradictory ways — either to liberate creative forces or to reinforce authoritarian tendencies. For example, electroacoustic dance music elevates the DJ from a bureaucrat with the function of selecting songs to that of performance artist. On the other hand, it cultivates a magical fascination that eliminates critical thinking and homogenizes behavior, encouraging individuals to replicate the same movements and thoughts.

3. ELECTRONIC MUSIC COMPOSITION

Do composers of electroacoustic music imagine a certain sound when composing or do they conceive of a musical structure to be filled with sounds? Is electroacoustic music composition the same as sound composition according to Varèse's definition of music as "organized sound?" If not, what is the difference and what distinguishes electroacoustic music from a work of sound art? These questions can be addressed within the broader context of electroacoustic music that cultivates intersections with other artistic forms that use sound as a primary medium of expression while paving the way for creativity within forms that take advantage of modern technology such as visual art. The term "multimedia" refers to forms of communication combining different media such as text, audio, and images. Multimedia is thus a kind of interdisciplinary matrix encompassing both acoustic and visual forms. However, we have to carefully consider the application of this concept to artistic works, as the manifold forms of artistic communication accomplish different functions in society.

First, we must consider the best way to analyze the form of an electroacoustic composition and how a composer uses individual sounds to create a sound structure that corresponds to the entire piece. We must examine how individual sounds constituting the structure of the work are defined. Alternately, we could also consider electroacoustic composition from a more traditional point of view, simply as a specific musical form to be analyzed with the traditional tools of music theory. In this case, we would emphasize the connections between the electroacoustic composition and the models of vocal and instrumental composition. From the starting point of sound not being an isolated object, we are able to understand it only within a compositional context. For it is not possible to speak of sound phenomenon without considering its connections to other sounds that create the sense of temporality. The world is not silent or mute. Our sense of temporality is closely related to our ability to perceive sounds in the acoustic environment, as the acoustics provide the temporal experience with sound objects and events. In the course of human history, music has been produced mainly with human voices and instruments. That is, until the development of apparatuses became capable of recording, manipulating, and reproducing sound for the purpose of creating new synthetic sounds. The electroacoustic sound is no longer attached to the body, whether by voice or instrument, but is the output of an apparatus. However, the universe of the electroacoustic music is not limited to all possible sounds that we are able to produce and listen to; it must include all perceptions and experiences that the work of art can offer.

Is the composer of electroacoustic music the person who drafts ideas or the one who produces the sounds? Can a single human being accomplish these two tasks? In fact, electroacoustic music has generated new fields of professional endeavors in classical and popular music, and in film and audiovisual creation. Alongside traditional artists such as singers, instrumentalists, conductors, composers, and lyricists — there have emerged new kinds of creators with artistic and bureaucratic functions. For example, the sound designer who creates new sound environments in film, the sound programmer who creates new synthesizers and sound creation platforms (DAW), and the sound producer who fulfills both administrative and business functions directly influencing the creative process, especially as seen in popular music. In fact, if we consider electroacoustic music in a broad sense as a multiplicity of categories, genres, and artistic forms, we see that musical creation depends on a network of ideas that require the use of apparatuses. The multiple agents involved in

the creative process develop specific competencies so that the continuous dialogue is the basis of the creative process. The dialogue involves the manipulation of apparatuses and the systematic exploration of their possibilities. The creation of electroacoustic music is a playful game with apparatuses in which human beings and intelligent tools continuously interact with each other. This idea of creation challenges the traditional question of authorship. Creation emerges not from a mythical author, but from the incessant dialog taking place in different stages of the process. The crucial question of artistic collaboration determines the transformational power of art and creativity in the current society.

How does one critically appreciate the quality of electronic music in general or the quality of electroacoustic music of a particular composer? What are the parameters for evaluating electroacoustic music in relation to vocal and instrumental music and how can we investigate the truth of the work for its authenticity and historical meaning? According to Heidegger, the creative preserving of truth in a work of art is what allows it to articulate a style within a culture [5]. The search for the answers to these questions is driven by the fact that electroacoustic music has become a fertile field of artistic and technological exploration and innovation affecting practically everything that is understood as music or sound art including the collective perceptions of listeners, composers, performers, and musicologists. The electroacoustic paradigm is one very particular form of life, as it concerns the whole of communication with sound and music in the society. It has exponentially increased the music information available to us, including the music of the past, and has radically transformed sound and music perception and consciousness. In this sense, it is a propitious field for exercising cultural criticism of the present.

4. LANGUAGE, SPEECH, AND ELECTROACOUSTIC SOUND

As analog systems of communication, music and language elaborate forms in the medium of sound with sound being the primary layer of language and the main communication system of society. As Wittgenstein suggested, sound is the surface of music that allows access into meaningful depth. Music shows us that we must dive beyond the surface of sounds to understand its complexity:

Music, with its few notes and rhythms, seems to some people a primitive art. But only its surface is simple, while the body which makes possible the interpretation of this manifest content has all the infinite complexity that is suggested in the external forms of other arts and which music conceals. In a certain sense it is the most sophisticated art of all [10, 11].

Language is built upon a very small number of sounds, or phonemes, that have no value in themselves but acquire value in relation to each other. The phoneme is a differential and connective element of language, which organizes sounds by means of phonological oppositions constituting the sound material of speech. Linguistic binary coding structures operate on the basis of a choice between a positive or a negative value. Moreover, the binary code of language constitutes a paradigm for other forms of communication. Speech is the act of using the language, which is linked to several factors that are not necessarily linguistic such as context, personality, history, culture, and society. Language is primarily a concept, a repertoire of possibilities viewed from the outside, while speech is associated with the ability to express thoughts and feelings by articulating sounds. Speech is not just

the physical materiality of sound, but also the muscular effort and psychic imprint. Put another way, language is the realm of the virtual where nothing is yet said, while speech represents the embodiment of the individuation process bringing the personal and collective unconscious into the realm of the conscious. Using Tarasti's existential semiotics terminology, the distinction between language and speech represents the movement from the immanent to the manifest through which meaning emerges [9, 157–177].

For Wittgenstein, musical understanding is a prototype that can be used to understand language: "Understanding a sentence is much more akin to understanding a theme in music than one may think" [11, §527]. There is family resemblance between the verbal phrase, the melody, and the musical phrase. Both music and language are primarily manifestations of a physical presence. Even sounds produced electronically need the vibration of objects such as the membranes of loudspeakers, to be perceived by the ear. However, different than vocal and instrumental music, which are manifestations of a bodily presence, electroacoustic music encompasses sounds that are abstract and disconnected from living organisms. This leads to the necessity of providing some organic foundation to the sound in order to attribute musical meaning. One example is the research on phonetics. A key figure in the early days of the Electronic Music Studio in Cologne was Werner Meyer-Eppeler — an experimental acoustician, information theorist, and phonetics expert who introduced many concepts in electronic music composition that grew out of his research on phonology. His ideas inspired the composition of Karlheinz Stockhausen's *Gesang der Jünglinge* [*Song of the Youths*] (1955–56), a piece representing a great evolution in the composition of electronic music as it integrated electronic sounds with human voices, and explored the similarities between phonemes and electronic sounds for developing new compositional methods. Since the early 1950s, electroacoustic music has been exploring the living quality of voice to create electronic imitations of phonemes and other elements of spoken speech such as formants, articulation, and intonation. The phonetic metaphor of sound inspired a new approach to electroacoustic material that shared the acoustical characteristics of speech — vowels are associated with harmonic sounds constructed from sine tones, fricative and sibilant consonants are related to filtered noises, and plosive consonants to impulses. The formants that shape the color of different vowels are associated with bands of frequency and timbres.

Wortlaut (1995) — length 12'37" — by Igor Kefalidis is an electroacoustic music work based on two poems by Austrian poet Ernst Jandl (1925–2000): *im reich der toten* (1964) and *der und die* (1963). Jandl was an experimental avantgarde poet who made a great impression on audiences with his apparent pessimism and uncanny humor during performances of his sound poems — linguistic experiments using fragmentation of words, phonemes, elements of surrealism, and a profound anti-Nazi sentiment. *im reich der toten* [*in the realm of the death*] is one of his war poems consisting of a sequence of words with no sense or apparent meaning. The words are combinations of phonemes with repeated letters indicating longer durations. Jandl recites the poem with clear timbres and great variation of intensity.³ Kefalidi's electroacoustic work extends the sounds of this poem into a large time scale. The digital samples of voice are transformed through time stretching, an algorithm that changes the sound duration by keeping its spectral structure — the temporal expansion reveals the microscopic structure of the sound. Time stretching is an application of the FFT

³ Video available at YouTube <https://youtu.be/wFJ1YI24A0A> (accessed September 15, 2020).

(Fast Fourier Transformation) method of analysis and synthesis that appeared during the 1980s with the popularization of digital signal processing (DSP). Spectral transformation generates sound families, hybrid sounds, sound mutations, and metamorphoses, based on the manipulation of the spectral information of the sound. The temporal expansion provides insight into the subtle layers of language such as intonations and microscopic variations of pitch, so that the expanded sound becomes itself a musical object. Additionally, Kefalidis used digital reverberation to shape the sounds of the poem with resonances evoking the acoustics of large sacral spaces. By listening to *Wortlaut*, one can feel an almost religious character that the voices of death take on.

In the second part of the composition — starting at 5'45", Kefalidis introduces a rhythm with percussion, followed by the steady recitation of the second poem *der und die [that and that]*. The percussion continues through the end of the poem consisting of 338 words, including a significant number of repeated words, each one formed by only three letters. The words are written in a matrix with 13 columns and 26 rows, which suggest a combinatory game of sound motives. In Kefalidis' composition, words are uttered in a regular pace as if they are sound figures detaching themselves from a background of long, extended sounds evoking the atmosphere of the previous section. The composition unfolds in a three-layered structure: (1) the rhythmic layer of the percussion sounds; (2) the layer of the pulsing short words of the poem; (3) the layer of the temporal expanded sounds of speech that prolong the texture of the first part. The ultimate effect of *Wortlaut* is an electroacoustic polyphony of sound textures on the basis of two poems with different characters and temporalities. The piece explores crossing boundaries between sound, speech, and music, as suggested by Jandl's poetry and has deep roots in the sound poetry of the Russian Futurist movement. This work of electroacoustic music is true to the experimental aesthetics of the early 20th century in which the interplay between sound, poetry, and visual art plays a significant role.

5. AUDIOVISUAL COMPOSITION

Currently, the concept of audiovisual art is framed by the dominant role film and television play in our society, founded on technology of sound and image reproduction invented in the second half of the 19th century. Cinematography, as an audiovisual art that emerged from the movement of technical images, elevated film to the most popular artistic form in human history. With the supremacy of the moving image, especially during the silent film era, it was possible to cross borders and establish patterns of transnational communication. As the sound film quickly prevailed as a product of mass consumption, cinema, and later television, shaped the perception of sound and image until the end of the 1980s when digital technology set the stage for radical transformation. The popularization of personal computers, mobile devices, and networks of information and communication, began to reframe the creativity of audiovisual art. Technology propelled convergences of sound, image, space, and performance to create new architectures of collaboration giving rise to new kinds of transnational dialogues. As the traditional structures of creation and production of audiovisual art underwent this enormous change, new artistic forms of audiovisual composition began to emerge.

In the universe of electronic music, there has been a growing interest in audiovisual composition with more electroacoustic works being coupled with video, and mixed works

combining electroacoustic sounds, live performance, and visual projection. Audiovisual composition has the potential to bring electroacoustic music to a broader audience, as it addresses a multimodal perception and sensibility. It reveals two important components; the convergence of fields and perceptions as well as the creation of a diversity and differentiation of forms. Composers of audiovisual works have much to consider. Based on their initial motivation to create a new piece, they are faced with the question of which will be more important — the music, the visuals, or the combination of the two? They must consider how the sound and image relate to each other as they attempt to intensify the immersive, sensorial experience and try to raise the consciousness of the interconnection between hearing and listening as a mode of being in the world. If they fail to achieve these objectives, should the audiovisual composition be considered just another distraction reinforcing the patterns of entertainment and diversion? As a society inhabited with myriad trivial objects and gadgets of audiovisual technology taking a hold on our existence, we have become saturated by the torrent of audiovisual impressions. Faced with this flood of information that can lead to a state of entropy, it is important to develop a critical reflection on audiovisual communication. We need a comprehensive account of the relation between sound and image beyond the conventional form of cinema in order to understand its full creative potential. It is necessary to deconstruct the hegemonic discourses and point out the broad spectrum of possibilities and diversity of forms within audiovisual composition.

PROOBOS, X2, APOPHONIE

Proobos (2000) — length 7'25" — for string ensemble, electronics sounds, and video was created in collaboration with video artist Alexander Pettai. The electronic music begins with a spacious and resonating sound texture, creating a pulsating that suggests a tactile sensation of vibrating matter, slowly evolving and spreading out. The visual composition develops a world of letters of different sizes and colors popping out, moving with different speeds, growing and disappearing like living organisms. After approximately one minute, the violin starts to play, establishing the presence of the string ensemble. The pulsing character of the electronic sounds continue as the visual composition emphasizes fusion by creating a plasma-like imagery heated at high temperatures to release sufficient energy to hold the letters together. The work achieves precise synchronization between electronic sounds, instrumental music, and visual composition through the pulsing energy that at once unifies the elements while expressing the chaotic energy of its atomic structure.

X2 (2014) — length 4'30" — for electronic sounds and video is another work in collaboration with Alexander Pettai. Both the music and visual composition create what could be described as a monolithic structure. The electronic music develops a density in texture in which pulsing structures emerge and spectral transformations evoke the movement of waves. The visual composition slowly reveals round forms associated with celestial bodies, eyes, or some kind of organic form. A particularity of the music is the use of very low frequencies, requiring a subwoofer for adequate listening. The low frequencies represent the immersion in a vibration-centered model, a key characteristic of the electroacoustic paradigm. The low frequencies produce the presence of a ubiquitous invisible vibration that has the power to take control of the body, mind, and senses.

Apophonie (2016) — length 5'35" — for two pianos, electronic sounds, and video is another collaboration with Alexander Pettai. The electroacoustic music is created on the

basis of speech sounds, but in a very different way than the pure electroacoustic piece *Wortlaut*. Here, the sounds of speech are quite fragmented with no recognizable meaning. We hear short syllables and phonemes of an imaginary language that sometimes evokes the phonetics of French. (Although this could be a subjective impression, as I am aware of Kefalidis' emotional relation to French, which also happens to be our common language.) After a short introduction, music for two pianos begins with single chords played in sync with strong accents and long rests in between. Later, the space is filled with other musical elements such as lines and movements. The visual composition develops fluid forms emerging from a black background, predominantly red and synchronized with the music, giving the impression that the acoustic energy is triggering the visuals.

S_S_S, TAPEEXT, VEGA_S

S_S_S (2018) — length 10'45" — for violin, percussion, electronic sounds, and video is a collaboration with multimedia artist Andrew Quinn. The music develops colorful sound textures with violin and percussion playing short melodic patterns in sync with electronic music. The composition suggests a permanent movement leading to the infinite. The visual composition emphasizes the musical flux with a texture of semifluid viscosity moving toward an unattainable horizon, above which an object in the form of a cup slowly oscillates like a pendulum. The dark environment in the beginning of the work evolves gradually toward a space with glowing energy ascending from inside. The musical composition expresses a trajectory from darkness to light through the transformation of the harmony and timbre of instrumental and electronic sounds, while keeping a strong balance between unity and diversity. The visual composition follows this trajectory until it eventually creates a glowing object that arrests our attention until everything stops and returns to darkness.

TapeExt (2018) — length 8'25" — for piano, electronic sounds, and video, is another collaboration with Andrew Quinn. This is a remarkable piece made up of multiple compositional layers: (1) a piano score that could be described as a contemporary toccata; (2) electronic sounds that develop unique sound poetics; (3) the combination of acoustic and electronic sounds that constitute an additional layer of musical meaning; (4) the combination of music and visual composition that holds everything together. All four layers are precisely synchronized to form a single unity — a tight and compelling audiovisual synthesis. In the beginning of the piece we hear complex attacks played simultaneously by the piano and the electronics as a single sound. Afterwards, the elements of these attacks detach from each other to become independent events. The piano score and electronic composition evolve as independent and interconnected voices of one electroacoustic mosaic. The visual composition extends the principle of polyphony to the visual domain as though the images act as additional voices. The first part of the piece leads to a climax interrupted at 2'50" when it presents a new structure of long electronic sounds that evolve in an extended melody. Visually, a tridimensional circle with a thick yet transparent texture appears. The piece culminates into a state of ecstasy, with the electroacoustic composition articulating a rhythmic, colorful, and intense sound as the visual morphs into a huge white circle with a granular structure filling the whole screen.

Vega_S (2019) — length 13'05" — for electronic sounds and video is yet another remarkable piece, representing a mature stage of Kefalidis' audiovisual composition style. Here, the electroacoustic music seems to bring forth the imagery, as though the sounds are endowed with visual symbolism. The visual composition by Andrew Quinn takes advantage of the

imaginative character of the music and seeks to create an organic relationship through the use of a thin white vertical line in the middle of the screen that varies in brightness according to the music. The line turns into a narrow dark space separating two walls that constitute the main element of the visual composition. The walls are curved with a translucent and pixelated structure in black and white that continuously rotate in opposite directions, changing speed according to the sonic variations of the music. Figures appear and disappear in the narrow space between the walls and the spaces and on their left and right sides and the pulsing activity of these intermittent elements are in sync with the music. At 5'20", a strong beat punctuates the visual composition and the music speeds up and ascends in a pseudo-quotation of a short compelling rock guitar solo (8'35" — 8'48"). As the musical energy increases, colorful strips are introduced in the wall landscape, rotating ever faster and disrupting the visual symmetry to create a fragmented, fast-moving kaleidoscopic image to accompany the rock guitar. The electronic music creates the impression of fluid space as the sound objects and events seem to move closer and then farther away. The visual composition explores the fluidity of the space by creating a kind of futuristic landscape that constantly moves without a clear direction. The audiovisual composition presents us with the ambiguity of experiencing a calculated universe while simultaneously allowing us the chance to move between the world of algorithms. Overall, it infuses us with energy and hope as it suggests the need to disrupt hegemonic structures of power to escape via beams of flight leading to unknown territories. *Vega_S* is an accomplished example of the synergy of sound and image. The multiplicity of connections between electroacoustic sounds and synthetic images portray the massive potential of audiovisual composition.

6. CONCLUSION: THE POWER OF IMAGINATION

The philosopher Flusser argues that the universe of synthetic images has the power to free us from the tyranny of linear thinking by inviting us to experience a new power of imagination [*Einbildungskraft*] to overcome dualistic patterns of thought [4, 33–39]. Reflecting on the cybernetic paradigm of dematerialized information, Flusser argues that technical images have the potential of reversing the process of alienation that has shaped the history of humankind. The calculative and analytical thinking of science and technology has decomposed the phenomena into abstract and punctual elements and has resulted in the crisis of modernity that affects all spheres of life, including the existential, social, and cultural — and has caused the lack of faith in the power of theories and ideologies. Technical images are the expression of the crisis, while at the same time, are the answer to overcoming it. They have re-codified the world by re-introducing magic and belief in the power of the image. Our culture is no longer concerned with creating a picture of reality, but with developing an alternative imagination by exploring the products of scientific and technological revolution. The alternative worlds that have emerged in computers and other digital devices represent this process of transformation from the abstract to the concrete. They are condensations of digital particles — samples, pixels, and bits — taking the form of sounds, images, and eventually bodies, robots, and other forms of life endowed with artificial intelligence. The more sophisticated the condensation processes of computers are, the more real the synthetic worlds become, so that we no longer distinguish between reality and digital appearance.⁴

⁴ For an account of Flusser's ideas and its application to music see [3].

Igor Kefalidis' electroacoustic and audiovisual works are a testament to the ability of art to create alternative worlds. His trajectory as composer affirms the belief in the power of imagination and its potential to frame freedom, and the optimism toward ourselves not only as individuals, but as social beings engaging in a process of dialogue. In a society whose economy becomes increasingly dedicated to providing people with entertainment and leisure, the artist must be ever attentive to the processes of mutations leading to the post-humanistic society. The reality of a shared world between human beings and apparatuses that is increasingly shaping our lives necessitates this reconstruction of freedom. As an artist committed to our time, Kefalidis explores the new possibilities of electroacoustic and audiovisual technology to create works to plot visions of the future. Igor Kefalidis shows us how to keep the inter-subjective dialog alive and how to actively participate in the practice of projecting new worlds — sounds, images, and works of art — in order to reaffirm the authenticity of human experience in the creative process.

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Received: February 1, 2022

Accepted: May 4, 2022

Author's Information:**Paulo C. Chagas** — Ph.D., Professor of Composition at the University of California, Riverside

Использованная литература

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Получено: 1 февраля 2022 года

Принято к публикации: 4 мая 2022 года

Об авторе:**Паулу С. Шагас** — Ph.D., профессор композиции Калифорнийского университета в Риверсайде (США)