The Performing Human Being in a Media Interaction Space

Multi- and intermodal productions by the Düsseldorf Theater der Klänge (Theatre of Sounds)

Jörg U. Lensing

Abstract

In the course of 35 years of work, the Düsseldorf Theater der Klänge (Germany) has dedicated itself to multimodal and, above all, intermodal manifestations of "form, movement, sound and light design as dynamic concentrations of action" as the Bauhaus master Laszlo Moholy-Nagy demanded in 1925 for a theatre of the future, in a total of nine intermedial productions. Such a theatre is not subject to the primacy of a particular genre, as is traditionally standard as dance, music or drama theatre—especially in German theatre—but rather uses the possibilities of presentation of theatre and song text, music, dance, scenography, video art, light design and possibly even further sensory stimulation to arrive at a holistic stage action in differently defined spectacle spaces. In the following scientifically oriented article, the artistic director of the Theater der Klänge, Prof. J.U. Lensing, shows how and why this ensemble was founded in 1987 on the basis of a Bauhaus stage postulate or a Bauhaus book publication. It also describes why the first two productions of this ensemble were based on Bauhaus stage ideas of the 1920s and what this has to do with the Folkwang University in Essen. Finally, starting from the reflection on the multimodality of these productions, the article describes the further systematically laid out course to intermodal stage approaches, in which the entire stage was also equipped with sensors as an interface for electronic reactions related to music and video scenography. The article's main topic is which approaches to sensorised stages was pursued, which were discarded as rather unsuitable, and which were further developed. Finally, the question arises about the meaning of such action and the status and definition of performers in such a stage form.

Introduction

The founding of the Düsseldorf Theater der Klänge emerged in 1987 from the so-called Folkwang idea, since almost all of the founding members at that time were recent graduates of the then still so called Folkwang Hochschule[1] (more conservatory of music than university) in Essen (Germany). In contrast to other ensemble foundings from this university, which were always clearly assigned to a specific genre (music ensembles, dance companies or theatre), the idea for a "theatre of sounds" was the interdisciplinary collaboration of dancers, musicians and actors, but also and above all choreographers, directors and composers. In fact, the visual arts played a subordinate role at the time of its founding, which can be explained by the range of studies offered by the Folkwang Hochschule at the beginning of the 1980s[2]. At that time, the university defined itself as a university for music, theatre and dance.

But even the selection of the first two materials for a first stage production involved the visual arts in the form of dance figurines and moving scenography. The actual visual-artistic designs for this were borrowed from ideas developed at the Bauhaus in Weimar in the 1920s (by the students Schmidt, Bogler and Teltscher and the Bauhaus master Laszlo Moholy-Nagy) and published in the book *Die Bühne am Bauhaus* (*The stage at Bauhaus*).[3] Both Bauhaus designs were based on the idea of moving three-dimensional images that were to be synchronised by music (and in Moholy-Nagy's case also by sounds) and brought into a temporally structured stage action. In a later essay, Kurt Schmidt spoke of a "stage organisation with simple forms."[4] Moholy-Nagy wrote about his *Mechanical Eccentricity*: "Form, movement, sound and light design of a dynamic concentration of action will be 'the mechanical eccentricity.'" Both approaches united multimodal possibilities of "polyphony" for the receptors eye and ear and thus a holistic approach in which traditional customs of music to dance or setting dramaturgical sequences to music played only a subordinate role. This was precisely the core of the founding impulse for an interdisciplinary ensemble whose name Theater der Klänge contains two decisive clues: *Theatre* as a collective term focusing on stage spaces for actions limited in time in a defined space in which a watching and listening audience gathers at specific times to witness an action concentration of moving images, objects, colours, human silhouettes (deformed to the point of abstraction), music, sounds and speech and/or singing. *Sounds* as the plural of sonorities that result from at least two, but more likely from a multitude of combined individual timbres to be composed.

Thought of further as audio-visual timbre composition, if one understands the audible and the visible frequency spectrum only as different frequency bands to be organised, for which people have two different receptors available (eyes and ears). Thus, multimodality and inter-modality were established, postulated and programmed from the outset, both for composition and for reception. It is said that the formulation of the Folkwang idea goes back to Karl-Ernst Osthaus,[5] a German patron of the arts and art educator until 1921: "Folkwang is the unity of all arts and all artistic education." He explicitly encouraged Walter Gropius, an architect he knew, to apply for the directorship of the Kunsthochschule and Kunstgewerbeschule in Weimar and promoted this application, which later led to the founding of the Bauhaus in Weimar, uniting the two schools. In Gropius programmatic speech called "art and technology a new unity" from 1923: "The widespread view that art is luxury is the pernicious consequence of yesterday's spirit, which isolated phenomena (*l'art pour l'art*) and thus deprived them of their common life.

The new spirit of construction demands fundamentally new conditions for all creative work. The tool of yesterday's spirit is the "academy." It led to the bleeding of the entire working life—industry and craft—from the artistic person and this resulted in his complete isolation. In strong times, on the other hand, the entire creative work life of the people was fertilised by the artistic man, because he stood in the midst of it, because he had acquired the same basis of work-related skill and knowledge in labourer practice, like every other workman of the people, from the bottom up, because the fatal and presumptuous error was not bred by the state that being an artist is a learnable profession. Art cannot be learned! Whether a creative work is done merely as a skill or creatively depends on the talent of the personality. This cannot be taught and cannot be learned, but a skill of the hand and a thorough knowledge as a basic prerequisite for all creative work, for the achievement of the simple worker as well as for that of the brilliant artist, can."

Das mechanische Ballett
(The Mechanical Ballet)

But let us return to the composition of the "stage organisation with simple forms," i.e. our realisation of the "mechanical ballet" (Figure 1): The total of five figurines, all of which consist of individual parts made in the primary and secondary colours (except violet), which in turn combine straight lines with diagonals and circles, are attached to bodies and limbs of human bodies by a buckle system in such a way that they become two-dimensional puppeteers of abstract form elements through body movements, but also three-dimensional through the depth staggering of the individual elements, which nevertheless have abstracted human appearances. Kurt Schmidt and his fellow students had already named these appearances in 1923: *Windmill, Machine Being, Locomotive, Dancer or Little One.* It is striking that the figurines designed by Kurt Schmidt, based on the primary and secondary colours mentioned, have object names, while the figurines designed by Bogler and Teltscher name human appearances and are reduced to the non-colours black, white and grey in the case of the "Dancer" and to pink and white in the case of the "Little One."
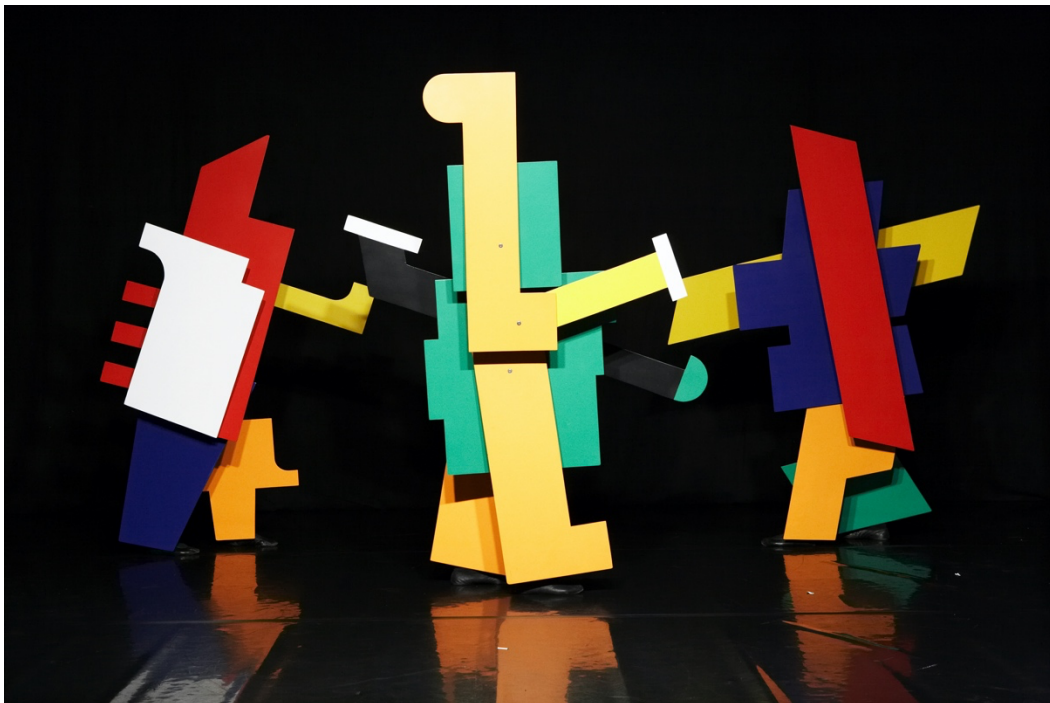

Figure 1. *The mecanical ballet: Machine Being, Locomotive, Windmill.*
THEATER DER KLÄNGE's new adaptation of "The Mechanical Ballet" by Kurt Schmidt.
Dancers: Laura Wissing, Kai Bettermann, Jacqueline Fischer. Photo by Oliver Eltinger, 2009.
THEATER DER KLÄNGE's Production, Düsseldorf, 1987.

Despite the disappearance of the dancers carrying these figurine parts behind these abstract shapes, the torso, arms and legs of the figurines still remotely resemble human body shapes. This ambivalence of the perception of a semi-three-dimensionally moving abstract colour image in a stage space and an abstracting body ballet had to be confronted in the new creation of 1987. In addition, the not insignificant question arose as to whether the clattering of the figurines in movement was to be consciously made a stylistic device or whether this was to be avoided and music used instead. If so, which music and with what intention of intermodal reception?

We decided to consciously use the inherent noisiness of the figurines (in our case, plywood hitting against each other) only in exceptional situations in the sequence and thus to expose the "cardboard comrades" as a brief wink just as briefly as at the end in the second choreographed applause, in which all five dancers briefly open by turning 90 degrees to the front in order to briefly expose and thus unmask the materiality and the carrying mechanism (i.e. the illusion of the previously created two-dimensional moving images) before the image of five two-dimensional figurines is immediately restored 4 bars later. Reminiscent of the use of pianist/composer Hans-Heinz Stuckenschmidt as the pianist of the 1923 premiere and imaginary accompanying instruments as visible in photos of the so-called Bauhaus chapel, we decided on a music-live accompaniment combo of piano, trombone and percussion. Decisive for the multimodality of the interaction of sound and image, however, was the requirement that the music be created "from a perfectly fitting cast" in the course of the rehearsals by the composer-pianist Hanno Spelsberg,[6] who correpetited in 1987, together with the dance-improvisational and later choreographic development of this new interpretation simultaneously in all scheduled rehearsals (Figure 2). From this specification, a ballet music developed that both partially referenced 1920s jazz music and offered the "classical" functions for a dance accompaniment: rhythm, partial illustration, imitation of mechanical, machine-like sound effects, commentary, dance prelude and conclusion as well as style and genre quotations.

Figure 2. The musicians for the *Mecanical Ballet*:
Hanno Spelsberg (Piano), Axel Heinrich (Drums), Peter Arnolds (Trombone).
Photo by Sascha Hardt, 1988. THEATER DER KLÄNGE's Production, Düsseldorf, 1987.

Die mechanische Exzentrik
(Mechanical Eccentricity)

For the second work of this double programme, the task was much more novel. For more than 30 minutes of the 33 minutes total running time of our realisation of *Mechanical Eccentricity*, there is no human being on stage (Figure 3). Nevertheless, there is a through-composed action sequence of moving objects, for a constantly changing scenography, for a permanently changing coloured geometric light setting, and for the use of a film visible in the moving stage set and, last but not least, for an auditory experience, which on the one hand is produced directly by certain stage objects, as mediated by loudspeakers that present a mixed form of electronic music and *musique concrète*. This audio performance of fixed sounds, which is chronometrically stable in every performance, was synchronised in our realisation by two slide projectors programmed in push-pull mode, in whose magazines slides were inserted that cast geometric patterns as coloured light onto the stage. The slides had been collaged from colour filter foils using a cutting technique and were oriented in their image

geometry and colourfulness to the main layer in Moholy's graphic score. Moholy had published a catalogue of keywords for this graphic score in the aforementioned book, in which the words "clowning" and "human mechanics" also appear at the end. We interpreted these two references in such a way that, on the one hand, a mute clown figure appears, who autonomously drives mimic-body-language moving objects (3 wheels) off the stage in order to make room for the subsequently appearing dancer, who conquers the stage as a "body object" moving in itself, in order to conclude the spectacle first through "human mechanics," then increasingly through a solo dance that develops more and more smoothly.[7]
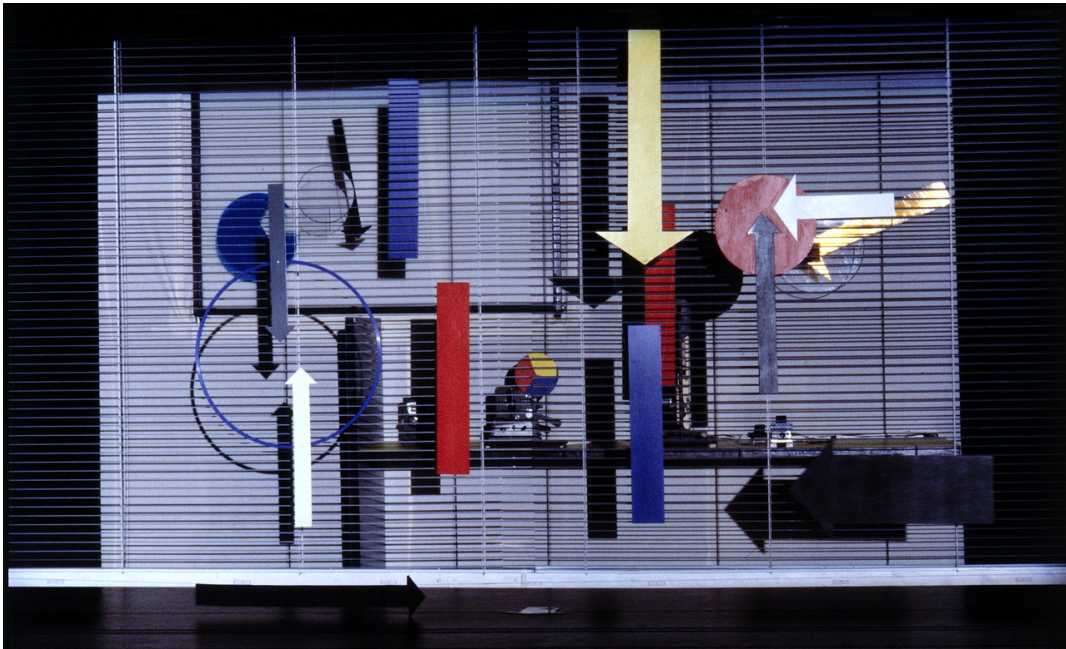

Figure 3. THEATER DER KLÄNGE's production of *The Mechanical Eccentricity* (1987) based on the (up until 1987) Moholy-Nagy's unrealised sketch. Photo by Sascha Hardt.

The multimodality here is initially limited to seeing and hearing, although rendering effects are also woven into the auditory experience, suggesting to the moving objects on the stage a noisy and sometimes rhythmic sonority that they themselves do not have. I use the term "rendu/rendering" here in the sense of Michel Chion[8] and translate it as "sensualisation". For example, a gold-coloured club object, which is moved into the stage space dangling on nylon threads and later divides into two halves, emits a bell-like heavy sound suggested by the loudspeaker reproduction. Through the *synchrèse*[9] the sonority seems to emanate from the object. Similarly, shortly before the clown figure appears, a smoking

stovepipe appears in the scenery, with a hissing sound suggested in synchronicity with the emission of smoke, which coupled with a smell we created with aroma additives, actually directly appealed to a third sense in the audience during the performance. This spectacle was about a sensual overpowering, an almost intoxicating experience which, through the combination of siren sounds with driving rhythms and an auditory, largely metallic impression of the sounds in combination with concrete sounds such as sirens, hissing, machine samples, etc., created an artificial sound space which complemented, accompanied, commented on and partly counterpointed the unleashed stage machinery on a second modal level. The *Süddeutsche Zeitung* wrote in 1989: "Technology and man are the ingredients of a magical flood of images that creates ever new tension. Finally, one emerges dazed from this maelstrom of moving images, but also richer for the experience of fantasies set wondrously in motion."[10]

Figur und Klang im Raum
(Figure and Sound in Space)

In 1992–93, the Theater der Klänge embarked for the first time on a project for multimodal interaction, which was to become the determining factor for a series of stage plays that from 2005 onwards led via *HOEReographien* to *SUITE intermediale* and in the wake of these two productions to *CODA*, the *Lackballett* and most recently to the fulldome production *Mensch und Kunstfigur im Kugeltheater*. But more about that later. The approach of *Figure and Sound in Space* on the level of multimodal interaction was that a computer system should be triggered by bodily actions in a stage space in such a way that light objects, light settings became visible and concrete sounds audible (Figure 4).[11] The stage space thus became an interface and at the same time a projection space for events that could be triggered and partly modulated by bodily actions of the performers on stage. At that time, there were only rudimentary technical solutions for such an interactively sensing and reacting stage, which is why we decided to develop, build and experiment with such instruments ourselves. Our solution at that time was six invisible cross light barriers superimposed on the stage floor, as well as a quadraphonic ultrasound system in the stage,[12] which could locate a microphone located in the stage by interference calculations. The light barriers were used in such a way that one could step into them and, by interrupting the respective light beam, trigger an impulse that was arbitrarily interpreted as a trigger by the

composer.[13] Accordingly, "stepping into" the respective light barrier triggered a sound or tone in each case, which could be heard quasi simultaneously from the loudspeakers in the theatre space. Irrespective of the latencies of this system, the performers were thus conditionally able to play a light barrier music by dancing on the stage floor in a targeted or random manner. Or to put it another way: the stage floor became a keyboard with six "keys" that could be played by the feet or bodies moving on the floor. In addition, one dancer could carry the ultrasonic microphone connected to a radio transmitter in one hand, so that body and arm movements of the leading microphone could be interpreted in the receiving *GAMS*-computer as graphic curves in such a way that control lines for modulations of synthetic sounds could be derived from them (amplitude and/or frequency modulations). A second computer, which could receive and interpret the trigger signals of the light barriers as well as the control data of the ultrasonic microphone, was programmed in such a way that it in turn could control six slide projectors and thus trigger slide changes, as well as a mirror system controlled by servo motors that could move certain slide light objects across a back screen controlled by dancer movement on stage.[14] So much for the theory and the possibilities.

Figure 4. *Figur und Klang im Raum* (*Figure and Sound in Space*).
Dancers Maria Lorrio, Kerstin Hörner and Ismini Sofou (with GAMS mircophone).
Photo by Sascha Hardt. THEATER DER KLÄNGE's Production, Düsseldorf, 1993.

The technology available in 1993, the prototype-like technical structure and the command line-oriented programming language common at the time allowed only a fraction of the above-mentioned possibilities to be implemented (Figure 5). In addition, another problem became apparent during the rehearsal and development process. Dancers are not educated and trained like musicians! While a musician usually sits and concentrates on the precise pressing, bowing, beating or striking of instruments, dancers are used to following the movement dynamics of their bodies as their biomechanics, mass inertia and centrifugal force allow and thus filling and measuring out a stage space through movement. Dynamics play just as important a role as the latency of impulsive movements, since it is always the body as a whole and not just lips, fingers or an arm that have to be set in motion, as is usual for musicians. This may result in a different way of making music if one wants to use the body as a playing instrument in a way that is appropriate for the body. This is a different approach to a different form of music than trying to create a musician analogy for dancers!
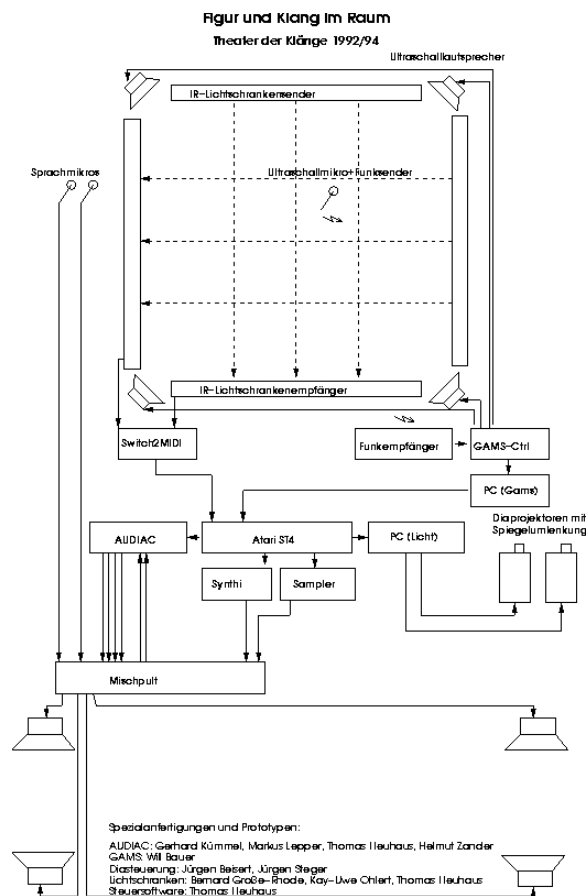

Figure 5. *Figure and Sound in Space.* The prototype-like technical structure.
THEATER DER KLÄNGE's Production, Düsseldorf, 1992–94.

In 1992–93, this only became clear to us in the course of the development and rehearsal process, and with it the fact that a light barrier system reduced to lines on the stage floor and an ultrasonic microphone system specialised in arm movements and position location were not the suitable interfaces that multimodal interaction in a dance stage demanded. Nevertheless, the attempt was worth it, since in part the rigid assignments of the modal perception of sound to stage actions had for the first time really been abolished or even reversed. In the "mechanical ballet" there was always a reaction of the musicians to the dancers' actions through the live music accompanying the performances. However, these were exhausted in improvised extensions (retardations) or shortenings of certain dance passages, depending on the dance sequences on stages of different sizes. But 95% of the music was always reproduced in the same way. The identity of the musical sequence was even stronger in the "mechanical eccentricity," since it was completely fixed on a stereo tape and the moving objects on the stage were always in action in more or less the same way at very specific points in the audio score (Figure 6).

Figure 6. The composer and programmer Thomas Neuhaus with his Computer-Setting. Photo by Sascha Hardt, 1993. THEATER DER KLÄNGE's Production, Düsseldorf, 1993.

In *Figure and Sound in Space*, the sensors used in the stage reacted to the actions of the performers and dancers, some of which were not meticulously choreographed[15] but left room for improvisation and spontaneous action decisions for the performers in certain passages. In these moments, a non-timed music emerged from the physical action. The possibility of applying this to musical or even visual agogics and phrasing of the sound and light possibilities failed on the one hand because the technique was not fully developed, and on the other hand because the training effort required to turn dancers into musicians acting gesturally would have been too high. But with these experiences in tow and with a much more developed technique, this approach was taken further from 2000 onwards in such a way that it resulted in the first successful realisation of a modal interaction in the Theater der Klänge piece *HOEReographien* in 2005.

HOEReographien
(HEAReographies)

Questioning the classical dependence of dance on music was the starting point of the project *HEAReographies* (Figure 7). The modal levels were intermodally dependent on each other. Dance, i.e. body movements in a stage space, was at the same time an artefact, i.e. a performance to be seen, as well as a gestural control of musical and sound parameters. At the same time, the live filmed dancer's body was image material for an artificial deformation on a video screen in real time, which was located in the background of the stage. In certain acts of the piece, the acting dancers reacted to the video deformations, or behaved in such a way that they "painted" certain images through body movements. The cautiousness of the movements led to a different musical-dance expression than the passages of "free" and thus also impulsive dancing in other acts of the piece.

HOEReographien was the result of a longer research process that started in 2000 and led to the pieces *Manifest* (2000), *Megalopolis* (2001), *Modulator* (2003) and finally the research project Performer-Computer-Interaction (PCI).[16] At the time, PCI was financed by the FH-Dortmund (Dortmund University of Applied Sciences and Arts) and thus enabled the development of a first computer instrumentarium with which a complete interactively controlled intermedial dance concert became feasible. In a way, *HOEReographien* is the functioning completion of the approach taken with the 1993 production *Figur und Klang im Raum*.
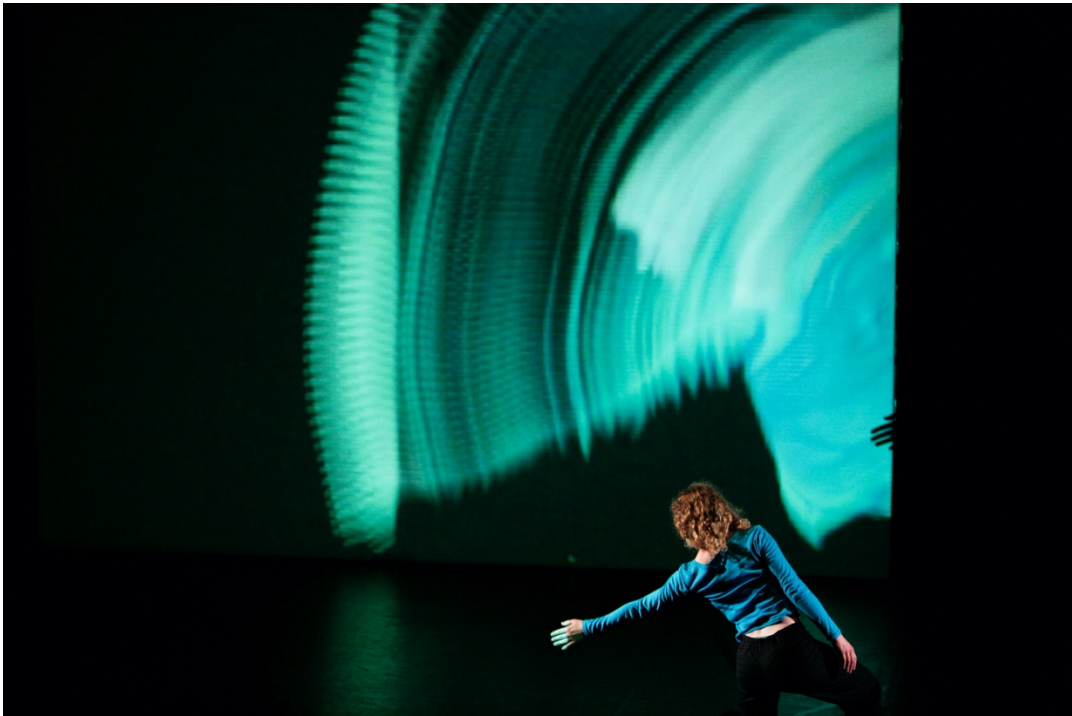
Figure 7. *HEAReographies.* Dancer: Caitlin Smith. Video by Lucy Lungley.
Foto by Oliver Eltinger, 2005. THEATER DER KLÄNGE's Production, Düsseldorf, 2005.

The questions of this work, which lasted several years, were:

1. To what extent can movements, lines of movement become audible in space?
2. What happens when music results from movement and what happens when musicians interact with dancers in this context?
3. What, furthermore, if the dancer's body is filmed on stage and formed into a video sculpture in real time, which in turn forms a moving whole with the human body on stage - real and virtual dance in real time?
4. If music emerges from dance movement and compositional structures are thus no longer developed, fixed and interpreted through musical compositional work, to what extent does the dancer take on compositional tasks?
5. What repercussions does this have on dance?
6. How do musical forms of variation and development manifest themselves visually in order to give a comprehensible form and structure to an initially amorphous sound result that has arisen from movement?
7. What form of light and video art as a time form results from this interactive coexistence?
8. And: How can this "new" process be made comprehensible for a live audience?

In the sensory, interactive stage of *HOEReographien* (Figure 8) no movement was without sound and image consequence, so that the action of a performer in this stage inevitably led to music and video stage image. *HOEReographien* was a cycle of individual pieces (solos, duos, trios, quartets) in the form of dance to electronic music generated by dance, dance to video sculpture developed in time and dance with live music in the form of structured improvisations, as well as mixed forms of these constellations, thus postulating an audio-visual overall composition as "autonomous" stage art in reference to the term "autonomous music."
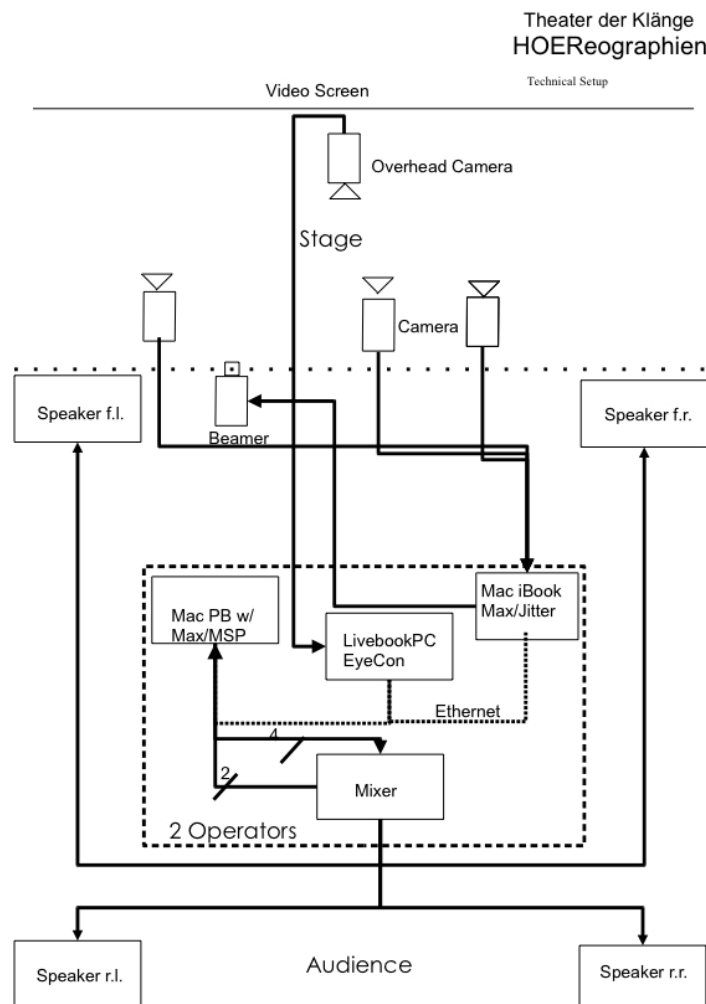

Figure 8. *HOEReographien* technical setup.
THEATER DER KLÄNGE's Production, Düsseldorf, 2005.

Before this final result could be worked out for a public premiere in 2005, however, technical questions, questions of self-understanding in dealing with such a stage arrangement and sensible possibilities of acting with such a sensorised, media-interactive stage environment for live dancers had to be found. The 1993 approach of turning dancers into musicians, so to speak, who would play on concrete trigger points or use limbs as gestural controls for musical parameters or moving light objects was deliberately discarded, since we had hardly achieved any useful results with it in 1992–93 that would have been worth continuing. Nor did we see an aesthetically satisfying approach in filming dancers and simply reproducing these video images one-to-one on a screen in enlargements or in sections, as it was the great fashion in many dance performances, especially in the 2000s.

That's why, from 2000 onwards, we looked for a system that could implement movements in a stage space as control parameters without having to wire the dancers for this or only allowing them to act in a small space. We tested various systems that were developed, for example, for colour recognition or the precursor of the *Kinect*[17] for gestural control of games, but only ever came up with results that would have severely impaired the aesthetics of the stage, costumes or dance. We found a suitable system in the development of a software and hardware combination called Eyecon, which did not have these limitations and, significantly, had been developed by a programmer[18] in collaboration with a dance ensemble. This system made it possible to monitor the entire stage space using a camera with fish optics in such a way that even a space the size of 10m x10m at a height of 4-6m could be completely captured. After experimenting with person tracking or dividing the entire stage into differently defined fields, we decided on the Activity-Play mode that this system offered, as it corresponded most closely to dance performance and made it easiest for an untrained audience to understand the coupling of sound reactions or visual image deformations through the dynamics of movements. The acting dancers/performers enter the stage space monitored by a black and white camera. In this way, they change the pixel constellation of black and white pixels per captured video frame. Depending on how strong, how numerous these pixel changes are, the result is a rising or falling control curve, which can be used as such by a second music computer for e.g. the modulation of dynamics or pitches or also the deformation/filtering of sound spectra. Due to the low latency of the system, the sound effects are directly coupled to the increasing or decreasing physical activities of the dancer moving on stage.

For the dancers themselves, it is relatively easy to learn how to work with the sound effects of their actions, although it became apparent during the development and rehearsal processes that the handling, the creation of musical phrasing and the pauses that have to be consciously set with it required the greatest learning process, since dancers tend to move without pauses when they are asked to improvise dance. This, however, is just as contrary to the need for comprehensibility in music as the necessity to develop dance improvisation derived from music as a way of dealing with constants and variables, i.e. ultimately as a visual thematic variation technique, in order to arrive at comprehensible and meaningfully developing temporal progressions both structurally and tonally. Improvisation, on the other hand, was required because it was not a matter of developing rigid choreographie[19] to musical scores that always run in the same way, but rather of playing a musically reacting system in ever new and varied ways, reacting in real time to movements in a defined, sensorised and visible stage space. The same applied to the creation of abstract images on the screen, which, however, should have a clearly recognisable reference to the live filmed bodies on stage.

The cameras in *HOEReographien* were clearly visible at the front of the stage, so that it was also clear to the audience when exactly who in which costume colour was dancing into which camera, and at that very moment an abstract deformation and at times also freezing of these visualities took place on the screen. This was obviously not prefabricated and projected, but filmed live and transformed into video art in real time. Both the composer and the video designer had to cope with other tasks in this inter- and multimodal arrangement, as did the dancers, who were also musicians and video image makers, and the choreographer, who had to provide the director's scenic settings with thematically recognisable movement material in such a way that it could be used live and improvisationally on stage. In fact, these two requirements became main themes for the majority of the following dance pieces of the Theater der Klänge: Developing a thematic variation system for dance improvisations derived from musical variation techniques.[20] As well as the understanding of the acting dancer body/costume as a "paint brush" for painting stage-sized canvases, which increasingly determined the scenographies of the dance pieces of the Theater der Klänge.

SUITE intermediale

HOEReographien was performed several times between 2005 and 2008, including demonstrations of the working method and technical set-up in contexts such as university presentations or at *Siggraph* 2006 in Boston, USA. In 2009, an abridged version entitled *HOEReographien Suite* was presented at the *tanzmesse nrw*, which was the prelude to another research project at Dortmund University of Applied Sciences and Arts in 2009–10 entitled Interactive Intermedia Performance (IIP).[21] This research project resulted in a modernised technical setup, which, in addition to an upgrade of Eyecon, worked with the MaxMsP-Jitter software for real-time video design and MaxMsP[22] for live music processing on the basis of HD-image input for video design. A 10m wide projection screen provided the complete stage background, an 8m wide black molleton curtain on the right side of the stage provided the necessary background for keying the video images, which meant that a lot of thought had to be given to whether there would be black costume parts, and if so, for which body parts, as these parts, concealed in this way, could not be seen in the video implementation (Figure 9).

Figure 9. *SUITE intermediale.* Dancer: Catalina Gomez. Video by Falk Grieffenhagen
Photo by Oliver Eltinger, 2010. THEATER DER KLÄNGE's Production, Düsseldorf, 2010.

The stage setting as a whole again reached the design size that had already been set in 1993 for *Figure and Sound in Space*[23] and again included body sounds and speech sounds in the setting, which had played no role in the works from 2000 to 2009 or, as in *Modulator* (2003), only a subordinate role (Figure 10). Body sounds were recorded live in the form of floor-contact microphones, so that partial foot noises on the stage floor became sound material (samples), as did rolling or otherwise acting bodies on a resonating stage floor used as a sounding board. In the last act of *SUITE intermediale* there was also a song sung live into a microphone, which became direct sound material for the deformation and modulation through movements.
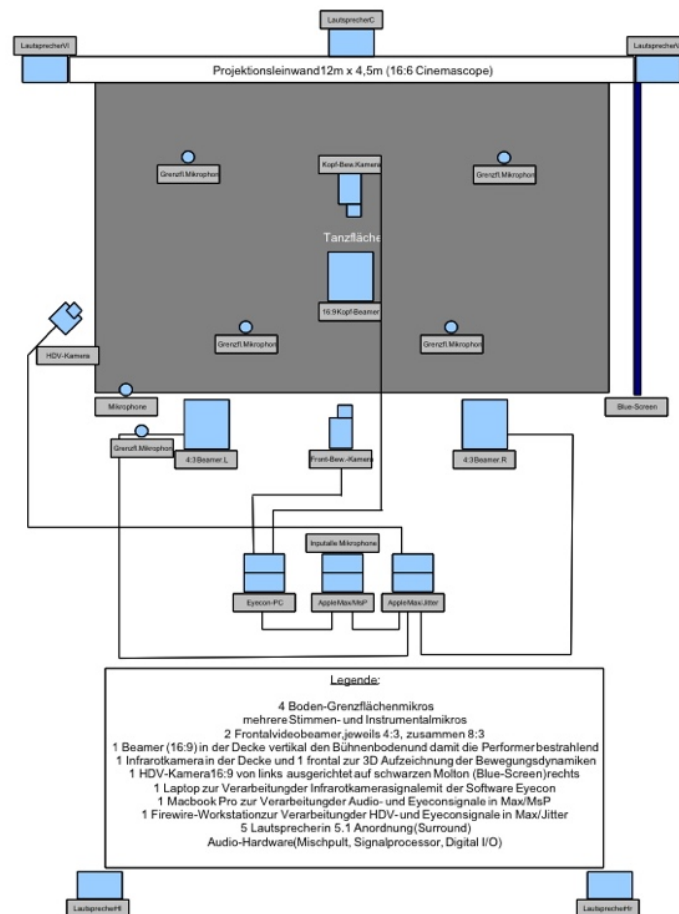

Figure 10. *SUITE intermediale*. The stage setting.
THEATER DER KLÄNGE's Production, Düsseldorf, 2010.

The question of interaction plays a decisive role in such a process, since it is not about individual authorship, but about collective development in the combination of the most diverse competences. The equality of musical algorithms, video algorithms, choreographic modular material and staging units alone demands discipline and respect for the performance of those equally involved in the development process[24]. In addition, there is the unusually large freedom of design possibilities for the performers, since they are not only dancers, but at the same time also image providers for the video input and musicians of the sound structures offered live by the composer.

At the same time, they have to work structurally improvising within the framework agreed with the choreographer, varying the set movement material. Last but not least, they must have a precise knowledge of the technique used, similar to that of a musician who knows his instrument well and knows how to play it. The technical possibilities of live-electronic music and live-electronic video being performed by and with professional dancers does not necessarily mean that a meaningful intermedial interaction will result. A meaningful intermedial handling of the possibilities offered is an acting-reacting-taking-up-continuing and leading to a designed consequence. Only when the sum of the media and variation possibilities used becomes more than the individual components and only when one becomes senseless or no longer feasible without the other, does a genuine intermedial and thus also multi- and intermodal performance result. Whereas the classical suite is a composed sequence of music for (stage) dances, the *SUITE intermediale* was a sequence of audio-visual compositions performed by dancers. Here, approaches of *Musique Concrète* met with electronically interactive music, as well as theories of "absolute film" and "expanded cinema" with modern real-time transformation by computer in a real-time composition that took on a varied form in each performance.

In 2010, *SUITE intermediale* represented the completion of the approach of 1987 (*The Mechanical Eccentricity*) and 1993 (*Figure and Sound in Space*) and was for several years the manifestation of the Theater der Klänge for a continuation of the multimodal Bauhaus stage approach of a "design of form, movement, sound and light to a dynamic concentration of action" into the digital age. However, it was important for us not to fall prey to the fascination with mechanics, as was the case for Schmidt and Moholy in the 1920s, but also not to succumb to the fascination with the digital, as has been the case in many productions of the last 20 years.[25]

The focus of our interest has always been the acting human being on stage, i.e. the trained performer who, by means of his physical-musical abilities, both dances for show and acts in a physical-gestural way for the audience to hear. At the same time, his moving body, colourfully defined by selected costumes, forms the colour palette and the form material for live video art as a scenographic setting in which he in turn acts and reacts and makes decisions that not only have effects on direct physical visibility, but also sound and scenographic. This recursive looping is defined as multimodal and intermodal.

VANITAS, CODA and Das Lackballett (the lacquer ballet)

In the Theater der Klänge productions *VANITAS - Schall und Rauch* (2012), *CODA - Bach's Cello Suite in C minor* (2013) and *Das Lackballett - Farb-Klang-Rausch* (2019), the *SUITE intermediale* setup was used as a tool for specific scenes or for other questions. VANITAS[26] is essentially a revue of the most diverse dance, acting and media-mixed scenes, as the Theater der Klänge has repeatedly used for other themes as *The Baroque Masked Stage* (1989), *November 1918* 1989* (1991), *Jubilee* (1997), *Megalopolis* (2001) or *Oops, We're Still Playing* (2022). *CODA* (Figure 10) uses the set-up of *SUITE intermediale* both for video playback of the scenography and for projection onto bodies, and incorporates a cello[27] as a live instrument into the sound, incidentally dispensing with floor contact or vocal microphones as were still used in *SUITE intermediale*.

Figure 10. CODA. Tobias Rosenberger (Videooperator), Thomas Neuhaus (Composer), Beate Wolff (Cello). Foto by Oliver Eltinger, 2013. THEATER DER KLÄNGE's Production, Düsseldorf, 2013.

The Lacquer Ballett (Figure 11) bears the subtitle *Farb-Klang-Rausch* (Colour-Sound-Frenzy) and once again draws its original idea directly from a historical "Bauhaus" original, the ballet of the same name by Oskar Schlemmer from 1941. The former Bauhaus master designed a so-called *Lackballett* (*lacquer ballet*) as his last stage work, not publicly—since he was considered a so-called "degenerate artist" at the time. It was performed once on 6 December 1941 in Wuppertal as part of a celebration of the *Wuppertaler Farbwerke Herberts*—which employed him at the time as an artistic collaborator and instructor for lacquer experiments—and was not revived until 2019. In 2018–19, the Theater der Klänge used the anniversary of 100 years of the Bauhaus as an opportunity to deal with this *Wuppertal* work by Schlemmer and to continue the idea in a new contemporary form and perform it again 77 years later. On the one hand, the figurines designed and realised by Oskar Schlemmer were reinterpreted.[28] The reinterpretation was primarily a matter of material and colour interpretation, as the subject of lacquer today allows for different responses than it did in the 1940s. On the other hand, in 2018–19 both the sculptural movement possibilities and the resulting choreographies in the form of figurine dances and a final "round dance" were newly developed for an evening-long programme. The *Lackballett* was embedded in an interactive live video scenography and interactive live electronic music, as Theater der Klänge had already developed and tested since *HOEReographien*. The result was a contemporary colour and form performance, a "colour-sound intoxication" that turned the theme of lacquer paintings in combination with lacquer figurines into light paintings that constantly reshape, paint over and appear differently through physical performance and music. In the spirit of Oskar Schlemmer, this is both a contemporary art action and a dance concert!

Intermodality in this piece in relation to musical modulation played a subordinate role in comparison to *SUITE intermediale*, but also in comparison to the preceding *HEAReographies* or the follow-up piece *CODA*, while it experienced an increase for the video level. The costumes/figures designed by Schlemmer are in themselves characterised by a variety of shapes and colours that the "normal" monochrome dance costumes for the previous productions could not offer. Therefore, the costume images alone resulted in a spectrum of "brushes" for the video input, which led to much more varied video images than was comparatively the case in *SUITE intermediale*. The screen was therefore set on a large easel in the truest sense of the word as a scenographic setting, so that the video images on this screen could be understood as "lacquer pictures" that were permanently being deformed and painted over, which were painted by the dancers as

painters/brushes through dance actions. Here the levels of perception become blurred for an audience: are they witnessing a dance performance, is this live video art, is this a live electronic concert with a stage show or is the whole thing a digital art performance incorporating electronic music and dance? Here it also becomes difficult to define the action as multimodal in relation to the perceptual levels of image and sound. The intermodal approach is obvious, although it plays a subordinate role in the live perception by an audience. The actors using a stage space as an interface space by means of Eyecon, MaxMsP and MaxMsP-Jitter are not understood as such, but as interactors not dependent on a specific technique in a picture, figurine, dance, music = three-dimensional art setting in a theatre context. This approach had to be extended to an even larger space with its media setting, as the Theater der Klänge did in 2021 with its production *Mensch und Kunstfigur im Kugeltheater* (*Man and Art Figure in a Spherical Theatre*) in the context of a full-dome space with spatial audio.

Figure 11. *The Lacquer Ballet*. Dancer: Tuan Ly. Video by Yoann Trellu.
Photo by Oliver Eltinger, 2019. THEATER DER KLÄNGE's Production, Düsseldorf, 2019.

Mensch und Kunstfigur im Kugeltheater
(Man and Art Figure in a Spherical Theatre)

With a large 180-degree projection dome and a spatial audio room with 64 speakers, the Planetarium Bochum (Germany) currently offers a technical infrastructure that is not available in conventional theatres or cinemas in this size and quality. At the same time, such spaces are only suitable to a limited extent for live art in the form of concerts or theatre and dance performances, as they simply do not have the stage and lighting requirements that theatres offer.

Based on a utopian design by Bauhaus student Andor Weininger for a spherical theatre from 1927, we took up this idea and planned a stage setting for the cooperating Planetarium Bochum that combined a minimally large chamber stage measuring 6m x 4m with an oval stage running around the *Universarium* (the light-star projector) as an action area. The limited lighting possibilities were supplemented by mobile tripods and LED spotlights in such a way that they ensured sufficiently dimmable theatre lighting. The cameras used for the video feeds and the Eyecon input for parameter control of sound and video were, unlike in previous productions, placed frontally on a tripod so that the angle of view of the cameras corresponded to that of the audience. In contrast to the purely interactive previous productions (see above), individual intermediate acts were created, which used existing visual and musical material to insert independent audio-visual intermezzi into the live acts as separators. The graphic visual material and partly also verbal off-commentaries for these interludes were derived from the books *Der Mensch*[29] and *Briefe und Tagebücher*[30] by Oskar Schlemmer. His reflection on the difference between human forms of representation (nude, body mechanics) and art figures derived from corporeality (figurines) was the reflective content of the piece *Mensch und Kunstfigur im Kugeltheater* (Figure 12).

In the 1920s, artists imagined new theatre spaces in which new forms of theatre would be seen in the future that would have little to do with the "old" concept of theatre. Never-before-seen technical set-ups, rotating stages or numerous cinematic projections and loudspeaker sound systems were supposed to make possible a total theatre[31] the likes of which the world had never seen before. Most of these utopias remained sketches and were never realised. Mainly because these theatres were never built and the technology of the time could not realise these visions. (see also *The Mechanical Eccentricity* at the beginning of this text).

Figure 12. *Man and Art Figure in the Sphere Theatre*. Dancer: Christian Paul.
Video by Yoann Trellu. Photo by Oliver Eltinger, 2021.
THEATER DER KLÄNGE's Production, Düsseldorf, 2021.

In this full-dome play *Man and Art Figure in the Spherical Theatre* of the Theater der Klänge, the stage actors have to stand their ground against the sheer superiority of the multi-modally challenging space. Will they be able to stand up to the oversizing of almost the entire space surrounding them as a projection surface? Are their vocal utterances still perceptible and relevant in the immersive sound space? The task was to find answers to these questions and to focus the audience's concentration on the dancers' bodies again and again and to let the results of their actions, which expand medially into the projection dome and into the enveloping sound space, emanate from them and lead back to them. At the same time, the aim was not to celebrate the technology or the intermodal setting as such and to demonstrate the virtuoso use of it, but to let both the unusual action space and the playable media become an integrative and yet self-evident component of such a media-theatrical action.

Figure 13. 3D-Visualization of the "Total theatre" (Walter Gropius for Erwin Piscator)
Available at render.theaterderklaenge.de

Conclusion

Let us return to Moholy-Nagy's postulate: "The design of form, movement, sound and light in a dynamic concentration of action will be "mechanical eccentricity." The goal of form, movement, sound and lighting design in a dynamic concentration of action is not mechanics and only to a limited extent eccentricity, but the meaningful interaction of a space as a projection and resonance theatre that appeals to both auditory and visual reception. Starting from the acting human being in this action space and its figurative, colourful, and gestural action possibilities at a certain point in time, in a certain musical-choreographic sequence for the purpose of reflection on a set theme for an audience that simultaneously receives, processes and, if necessary, aesthetically enjoys the complete multi- and intermodal offer as a total work of art.

It should not be concealed that in the 35 years of this preoccupation with multimedia, intermedia, but also multimodal in reception and inter-modal in handling questions for a "different" theatre with artistic directors and festival curators, we have had and continue to have considerable difficulties in accepting such an approach.

Just as all Bauhaus stage ideas were and still are rejected by theatre directors and, since the 1920s, by the entire dance world as being largely non-dance and irrelevant for the further development of theatre, we are repeatedly accused by the directors of theatres and festivals of not being a real dance ensemble or a real theatre of drama. Similarly, we are hardly ever classified as contemporary music theatre, let alone opera, and the contemporary music scene also has difficulties classifying our work as so-called new music. On the one hand, this is true, since our approaches and themes—as explained above—can hardly ever be assigned to one genre or another, but it makes the multimedia and multimodal approach a problem, since most existing houses and festivals define themselves in genre-specific terms and thus exclude cross-genre works or at best want to subordinate them to a genre dictate. Thus, a good 100 years after the first formulations of multimodal modern theatre forms (realised or sketched out as utopias), we continue to experience the greatest possible prevention or at best toleration of such theatre approaches. This is mainly due to the fact that the bourgeois theatre houses and festival curators —as well as the public authorities when awarding larger subsidies—tend to think in terms of dance or drama theatre, and for some years now also in terms of the so-called applied theatre sciences, but are hardly open to multimodal or intermodal open approaches to creation without the primacy of one of the classical genres mentioned above!

Author Biography

Jörg U. Lensing has been a professor of Sound Design at the Dortmund University of Applied Sciences and Arts since 1996. He studied composition at the Folkwang University of the Arts in Essen from 1981 to 1987. He founded the series of concerts *Neue Töne* and the ensemble *Kunst-Stoff* during this time. First music theatre composition *Ich will zu Dir – Ach komm doch* for two dancers. In 1986 he won the Hochschulpreis at the Folkwang University of the Arts. 1987: exams in composition. From 1987 to 1989, he studied (post-graduate) New Music-Theatre with Mauricio Kagel at the University of Music and Dance in Cologne. In 1987 he founded the THEATER DER KLÄNGE in Düsseldorf. Since 1987 he has continued to work as a director, choreographer, and composer for theatre music until now, including 29 productions of this theatre and several compositions of incidental music for theatres and movies. Since 1990 he has also worked on film compositions and sound design for nearly all the films of German film director Lutz Dammbeck. In 1992 he was a guest lecturer in drama direction at the Bauhaus Dessau.
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Notes

1. In 2007 the former Folkwang Hochschule Essen became the Folkwang University of the Arts with campuses in Essen, Duisburg and Bochum.

2. At the time the ensemble was founded in 1987, there were offers for various music studies, theatre, pantomime, ballet and contemporary dance at the Hochschule Essen-Werden.

3. The Stage at the Bauhaus (Dessau: Bauhaus Books, 1925), (Mainz / Berlin: Florian Kupferberg Verlag, 1965)

4. The "mechanical ballet" is now called 'stage organisation with simple forms.' This new designation is more accurate, because by something mechanical one understands something only mechanical, this was not the case with the 'Mechanical Ballet,' because the forms were moved by people" (Kurt Schmidt)

5. Karl-Ernst Osthaus (* 15. April 1874 in Hagen; † 27. März 1921 in Meran) from Wikipedia.

6. Das mechanische Ballett: Directing&Choreografie by J.U. Lensing. Figurine-making by Udo, J.U. Lensing, Ernst Merheim. Music by Hanno Spelsberg.
See www.theaterderklaenge.de

7. Die mechanische Exzentrik: Performance score, direction and music by J.U. Lensing, Stage construction by Jürgen Steger, Light slides and back pro video by Sascha Hardt, Music for the sequence "Electric apparatuses" by Thomas Neuhaus, Choreography of the *Human Mechanics* by Malou Airaudo. See www.theaterderklaenge.de

8. See *Audio-Vision* by Michel Chion and J.U.Lensing published by Schiele&Schön 2013

9. Ibid.

10. Eva-Elisabeth Fischer, *Süddeutsche Zeitung,* February 10, 1989.

11. *Figur und Klang im Raum*: Score, direction, choreographies by J.U. Lensing, Music by Thomas Neuhaus, Scenography and Light, Objects and Slides by Jürgen Steger. See www.theaterderklaenge.de

12. GAMS: Gesture and Movement Sensor from the Canadian developer Will Bauer

13. The idea for such an electronic-interactive setup came from the composer Thomas Neuhaus in 1992–93, who subsequently also took over the development and a large part of the programming work.

14. The slide control computer was also supplied with a programming language by Thomas Neuhaus, while the digital/analogue interface for the projector control and the control of the mirror motors, as well as the mirror cabinet, were realised by our stage designer at the time, Jürgen Steger.

15. Action score and staging/choreography was done in both cases by the author of this article

16. Research documentation on PCI is available online at:
https://www.academia.edu/83783197/PCI_Forschungsbericht

17. Kinect is a hardware for controlling the video game consoles Xbox 360 and Xbox One, which has been sold by the company *Microsoft* since the beginning of November 2010.

18. The German programmer Frieder Weiß developed "Eyecon" over several years in collaboration with the dance ensemble *Palindrome*.

19. *HEAREOgraphics*: Director: J.U.Lensing, Music: Thomas Neuhaus, Video design: Lucy Lungley, Choreographic work: Jacqueline Fischer. See www.theaterderklaenge.de

20. The highlight of this variation technique, derived from contrapuntal music and applied to dance, was our 2016 production *Die Kunst der Tanz-Fuge* (*The Art of the Dance Fugue*) from which a workshop programme was developed, which can be followed online via our virtual theatre: www.theaterderklaenge.de and render.theaterderklaenge.de

21. Research documentation on *IIP* is available online at: https://www.academia.edu/68702604/Interaktive_intermediale_Performance_Ein_Forsch ungsbericht

22. MaxMsP and MaxMsP-Jitter are developments of the company Cycling74, https://cycling74.com

23. For *Figure and Sound in Space*, a 10m wide and 5m high screen was set up in the back of the stage. In *HOEReographien* there was only a 5x4m screen in the backstage left. The right part of the 10m wide stages was hung out in black. The screen for *SUITE intermediale* was 10m x 4.30m. Originally, a larger round horizon screen was even planned for *SUITE intermediale*, but this was not realised because a larger black background was needed for keying.

24. *SUITE intermediale*: Directing by J.U. Lensing, Choreographic work by Jacqueline Fischer, Music by Thomas Neuhaus, Videodesign by Falk Grieffenhagen, Dancer by Sarah Biernat, Alex Carrillo, Bernardo Fallas, Catalina Gomez, Nina Hänel, Arthur Schopa. See theaterderklaenge.de

25. See several stage presentations at the US-*Siggraph* or in Germany, for example, the festival *Temps d'images*.

26. VANITAS: Directing by J.U. Lensing, Music by Thomas Neuhaus, Choreographic work by Jacqueline Fischer, Videodesign by Fabian Kollakowski

27. CODA: Directing by J.U. Lensing, Music by Thomas Neuhaus, Choreographic work by Jacqueline Fischer, Videodesign by Tobias Rosenberger, Cello by Beate Wolff, Dancer Nina Hänel, Phaedra Pisimisi

28. *Das Lackballett*: Directing and Music by J.U. Lensing, Choreographic work by Jacqueline Fischer, Videodesign by Yoann Trellu, Figurines by Christian Forsen, Caterina Di Fiore.

29. *Der Mensch*: *Unterricht am Bauhaus* (Neue Bauhausbücher, Mann, Gebr.; 3. Edition 2014)

30. Oskar & Tut Schlemmer, *Briefe und Tagebücher* (Berlin, Deutsche Buch-Gemeinschaft, Albert Langen)

31. In fact, Walter Gropius designed a so-called "total theatre" for the Berlin theatre-maker Ernst Piscator in 1927, but it was never built. In 2021, the Theater der Klänge realised this theatre design as "The Virtual Total Theatre of Sounds" as a "walk-in" 3D online version, partly equipped with interactive contact points: render.theaterderklaenge.de

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