Performance of Musical E_Motion:
From Dionysian Mysteries to Dancing Media

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Every tone, every sound emerges from some kind of movement. The musician's arms, fingers and the organist's feet dance on their instruments, and the vocal chords dance on the air of the singer's breath, balanced by his lungs and diaphragm. Even the mouse click, view or vocal demand for accessing a sound from a digital sound-database is a physical impulse. In analogue music production, the motoric quality of the movement raises an emotion which designs the expressive quality of the music. The audience receives an impression that elicits an emotion similar to the emotion expressed by the music. As emotions unconsciously mark the emphasis of a human's value system, they control his or her fundamental convictions and behavior.

Looking at an action, the spectator is affected by the emotional content of its movement. This unconsciously and automatically functioning physical response of empathetic transference is the basis of every emotional participation as well in everyday living as in theatrical performances. In music and dance, the non-verbal communication via empathetic transference opens the widest possible horizon for communication beyond social classes and cultural boundaries. Even misunderstood denotations of codified kinetic and proxemic gestural repertoires allow the recipient to perceive the expression of the dramatic action and the emotional content of the performance.

Opera as a European cultural technique emerged from the Florentine Camerata's misunderstanding of the composition of speech, action, music and dance in ancient Greek tragedy. Count Bardi and

his companions believed to step back to the cradle of theatre and to revitalize the performative form of Greek tragedy by initiating operas with through-composed arias.

In ancient Greece, singing, drumming, playing aulos, flutes and harps accompanied the dances of the celebrants of the Dionysian festivities. In the performances of Greek dithyramb, music and dance were constitutive parts of the rituals, and their immersive qualities should lead the actors to trance and enthusiasm. In this way, the celebrations provided the gifts of the god of vegetation, rapture and ecstasy to his devotees.

Like in many cultures of the world, the ecstatic movements of the singers and dancers were intended to open their minds for their unification with Dionysus and for divine inspiration. They got to know a kind of freedom from bondage, constraint and repression – at that time a highly desired experience especially for women. The Dionysian mysteries are supposed to be one of the origins of European theatre, which then flourished as the Great Dionysia.

In his drama *The Bacchae*, Euripides described the action of the maenads as a wild dance beyond consciousness and as an arbitrary copulation beyond love or marriage. But he also criticizes that Dionysus seduced his devotees to tearing and rupturing animals and even human beings in their frenzy.

The Greek director Theodoros Terzopoulos explored the actional, gestic sources of Greek tragedy and developed a physical technique for its performance involving "the seven zones of energy"[1] of the actor's complete body. In his staging of Euripides's *The Bacchae* in Epidaurus, his actors performed the ecstasy in a constant tremor of their bodies, starting from shaking their shoulders down to their feet, while the performer of Dionysus pulsated the action by shouting loudly and beating the drum.

In the history of western opera and operetta, the movements in realistic productions followed the action and occasionally added some symbolic constellations and movements. The classical ballet became the only completely codified performance technique in European theatre. It included folkloristic dances to signify social and local areas. In opera and operetta, dances illustrated festivities or performances within the

musical drama. Richard Wagner intended to combine dance, music and poetry as the "sister arts"[2] in the "future work of art", obviously unaware of the fact that already during his lifetime, the popular musical theatre consequently realized this concept. On the opera stage, dances frequently had to enliven the statuary action. In *Ariadne auf Naxos*, Hugo von Hofmannsthal had his majordomo complain the emptiness of the *opera seria* stage and demand that „this desert island should be decked rather properly with the staff of the other play",[3] the dancing comedians.

When the great world exhibitions of the 19th and 20th centuries presented Indian, Balinese, Chinese and Japanese theatre and Mei Lanfang toured Europe and the USA, the western theatre faced the gestural semantic narration of East Asian theatre art. The European theatre reflected alienation techniques and adopted artistic choreography – in musicals especially: acrobatics – in its performances.

The artificiality of choreographic movements corresponds with the virtuosity of bel canto.

When the globalization liberated the human body in *art nouveau* and *Ausdruckstanz*, the dance gained more creatural, erotic and sexual expressivity. The representative parades and the dance inserts in musical dramas temporarily dispense the audience with reflection and release the cultural demands to decode the impact of the drama. Instead, the dance offers an energetic charge and an immersion into natural, emotional compassion.

Since the 19th century, operas and operettas have mostly used forms of ballroom dancing as a domesticated form of couple dance. Musicals from their start with *The Black Crook* in 1866 on followed their roots in vaudeville, variety, extravaganza, revue and show traditions, and they also included forms of show dance and acrobatics. The musicals developed different genres. Among those fourteen genres, listed in Thomas Siedhoff's *Handbuch des Musicals,* the dance musical, starting in 1924 with *No, no, Nanette*, emphasizes dance and subjects of body movements. As musicals often display phenomena of contemporary life and art, their dance repertoire reflects the actual scene of fashionable dances together with their social and local significance:

Dances in Musicals[4]

Black Bottom	Habanera	Rumba
Bolero	Hip-Hop	Salsa
Boogie	Jazz Dance	Shimmy
Bossanova	Jitterbug	Softshoe
Breakdance	Madison	Square Dance
Can Can	Mambo	Tap Dance
Cakewalk	Mar(s)ch	Tango
Cha-Cha-Cha	Onestep	Tarantella
Charleston	Polka	Twist
Cotillon	Quickstep	Two-Step
Flamenco	Ragtime	Valse Boston
Foxtrot	Rock 'n Roll	Walzer/Waltz

In ballet and performative action, the narration in movement also uses signs and codes of the pantomime.

Some of the most popular musicals especially featuring dance are (in chronological order):

Top Hat (1935)	*Evita (1978)*
Oklahoma! (1943)	*Eubie! (1978)*
On the town (1944)	*42nd Street (1980)*
The King and I (1951)	*Les Misérables (1980)*
Can-Can (1953)	*Cats (1981)*
My Fair Lady (1956)	*Nine (1982)*
Rodgers + Hammerstein's	*Starlight Express (1984)*
Cinderella (1957)	*Phantom of the Opera (1986)*
West Side Story (1957)	*Fame (1988)*
The Rocky Horror Picture Show (1973)	*Miss Saigon (1989)*
A Chorus Line (1975)	*Elisabeth (1992)*
Chicago (1975)	*Beauty and the Beast (1994)*
Grease (1978)	*The Lion King (1997)*

Tanz der Vampire (1997) *Tarzan (2006)*
Saturday Night Fever (1998) *Flashdance (2008)*
Footloose (1998) *Cléopâtre, la dernière reine*
Mamma Mia! (1999) *d'Égypte (2009)*
Dracula (2001) *Love Never Dies (2010)*
We Will Rock You (2002) *Ghost (2011)*
Dirty Dancing (2004) *Strictly Ballroom (2014)*
Billy Elliot (2005) *An American in Paris (2014)*
Lord of the Rings (2006) *Moulin Rouge (2018)*

Dances in musicals show different aspects of life and accomplish various functions:

1. Rituals:

   a. The cradle of European Theatre was generated by the satyr-dances and dithyramb performances in ancient Greece. So, from the very beginning poetry, music, dance and action formed the ingredients of theatrical events.

   b. A late and ironic theatrical ritual was the 'time-warp' in Richard O'Brien's musical *The Rocky Horror Picture Show* which pretends to initialize an intentional time leap.

2. Creatural movements of anthropomorphized animals:

   a. T. S. Eliot's *Old Possum's Book of Practical Cats* came to stage life in Andrew Lloyd Webber's musical *Cats,* and the choreographer Gillian Lynne had to invent a dance-style that, supported by the costumes, copied movements of the animals and could also evoke their individual characters. In their filmization[5] of the musical, the directors Tom Hooper and Lee Hall worked with 13 collaborators of the special effects department, 694 specialists for the visual effects and 109 animators to create a big variety

Disney's The Lion King © Disney / Johan Persson

of animal like movements for the cats. Andy Blankenbuehler's choreographies mixed different styles such as classical ballet (for Victoria and partners), modern dance, hip-hop, tapdance, show dance and acrobatics. The visual artists still added special movements of the cats' ears and tails.

b. In *The Lion King*, music by Elton John and others, Julie Taymor's staging features actors in animal costumes, dancers with animal figures on the top of their heads, and giant puppets moved by dancers inside. Garth Fagan's choreography also mixed animal-like movements with jumps like *grand jeté* and lifts.

c. The successful strategy of Disney Theatricals to set animated film subjects to stage also visualized the jungle environment in Phil Collins's *Tarzan.* For the gorillas who saved the orphan baby, the adult Tarzan and the British botanists, Merle Tankard

choreographed[6] special moves to characterize the different states of civilization.

d. In Alan Menken's *Beauty and the Beast*, the beast's dance with Belle reveals the starting rehuminization of the enchanted prince's animal body and his emerging love together with Belle's waning fear.

3. Physical and motoric expression of a social group and self-expression of a person's identity:

a. In the 19th century, tapdance became a new stage dance technique. Influenced by folklore dances such as flamenco and the Irish jig, it was promoted by Eleanor Powell, The Nicholas Brothers, Samy Davis jr., Fred Astaire and Gene Kelly. Soon, tapdancing flourished in shows and dance films like *An American in Paris* and was also performed in musicals.

b. Following the fashion of dance musicals in the 1970s and 1980s, *Eubie!* became a successful revue showcasing 23 songs and dances of Edward Blake.

c. The social aspect of the border-crossing dance rapture became the subject of Elton John's *Billy Elliot*: The son of a coal miner overcomes the prejudices of his social class, becomes a student of the Royal Ballet School and succeeds as a ballet dancer.

4. Non-verbal compassion and comfort:

a. In Webber's *Evita*, the Argentinians dance tango to comfort each other after their admired First Lady's decease.

b. In *Moulin Rouge*, Satine, the courtesan and star of the theatre, loves the poor poet Christian but is forced to accept the theatre's

financer as her lover so that he might prevent the theatre's ruin. Her colleagues dance a tango to express their compassion with her sacrifice. The tango also expresses the comforting tenderness of a couple's embrace.

5. An aestheticization of violence:

a. A tango may expose the ambivalence of sexual attraction, passion, jealousy and violence. In *Moulin Rouge*, a jukebox musical after Baz Luhrmann's film, the tango on Sting's song *Roxane* fits the dramatic situation: The young poet talks his beloved Satine out of prostituting herself, but the impresario forces her to surrender to the Duke, who shall save the theatre. During his seduction and final rape, Satine's companions dance the tango to express the rigour and brutality in sexual relationships. The dancers act out male dominance and female submissiveness.

b. Sublimated aggression as performed in the martial arts of the Beijing opera and the Balinese Baris and Kris dance inspired some fight choreographies in musicals like Rob and Ferdi Bolland's *3 Musketiers, de Musical* and in Kamel Ouali's compilation musical *Cléopâtre, la dernière reine d'Égypte.*

c. The possibilities to hurt the dancers display some recent forms of the punk-style "pogo". The so called "wall of death" sets contrasting groups that, following the strophes of the music, hurtle into each other. Its variation as "wall of folk" transforms the aggression of the dance into an arrangement of mixing groups.

d. In the Eastern movies, warriors dance, jump and fly virtuosically to visualize their superhuman power gained by Kung fu. In Phil Collins' musical *Tarzan*, the gorillas have to fight animals and human aggressors. Taking advantage of their ability to swing on

Elisabeth, "In the night world of the dead and dreamers" and the reprise "On deck of the sinking world" © Brinkhoff Moegenburg

lianas in the jungle, they tackle the enemies hanging and swinging on aerial cords and straps according to the musical rhythm.

6. Danse macabre:

   a. Sylvester Levay's *Elisabeth* starts "In the night world of the dead and dreamers" with "Alle tanzten mit dem Tod" and it ends with the reprise "On deck of the sinking world" ("Alle Fragen sind gestellt") that shows the decadent society of the imperialist order.

   b. "Der letzte Tanz" is the death figure's seduction to allure the empress to follow him by dying for love.

   c. In Jim Steinman's *Tanz der Vampire*, dancing becomes a diversion in the eternal boredom of the vampires' lives.

d. Lars von Trier filmed *Dancer in the Dark*[7] with music by Björk about a mother who compensates her dull everyday life by dreaming of musicals, while her orientation in her factory environment becomes a dangerous dance as she is going blind, but continues to work for gaining enough money for her son's surgery to prevent him from going blind too.

7. Uncodified creative virtuosity in the vernacular[8] moves of breakdance and street dance:

a. Herbert Ross's movie *Footloose* showed early moves of breakdance such as salto, footworks and downrocks. The musical as an adaptation for the stage followed in 1988.

b. The rocky choreography of Adrian Lyne's *Flashdance* showed further powermoves (rotation on a part of the body) such as a backspin (a rotation on the back) in the dances of Alex, a welder who performs her self-taught moves in a night club.

c. The rising fashion of breakdance and street dance flourished in Max Giwa's and Dania Pasquini's movie *Street Dance 3D* and its sequels. They present cross-overs of classical ballet and street dance in mixing the virtuosity of both techniques in a final battle. Inspired by a Royal Ballet performance of Sergej Prokofiev's *Romeo and Juliet*, the leader of the street dance group learns some classical ballet lifts and mixes elements of the love *pas de deux* with moves of the street dancers. Kenneth MacMillan's, John Cranko's and Rudolf Nureyev's choreographies may have inspired the classical parts.

8. Power to build a community:

    a. In many musicals, festivities bring people of different origin together. Richard Rodgers's *Oklahoma!* was one of the first to use songs and dances to carry on the action.

    b. In ABBA's *Mamma Mia!*, the dance fever of Donna who in her hippie time acted as the singer/dancer of a girl group and then inherited a hotel on a Greek island, infects the inhabitants of her rural community to leave their regular roles and work behind and celebrate a common dance. The joy and power of dancing in a mass movement raises their self-confidence and encourages especially the women's emancipation.

9. Intermingling versus contrasting different classes of society:

    a. In Eleanor Bergstein's *Dirty Dancing*, music by John Morris, the upper-class girl Frances Houseman, called "Baby", spends her holidays with her family in a resort. When the solo dancer Penny Johnson falls ill, Frances undertakes her part in a performance. She falls in love with her partner Johnny Castle and compels her parents to acknowledge his personal and professional qualities in spite of his lower social status. The professional training and solo performance in front of an audience helps her to develop her personality.

    b. In Leonard Bernstein's *West Side Story*, Jerome Robbins's choreography exposes the aggression of the opposed youth groups "Jets" and "Sharks". An attempt to bring the opponents together in the ballroom scene ("The dance at the Gym") fails. The female and male dancers stand in opposite lines in order to choose a dance partner of the opposing group. But when the music starts, they stick to their own kind and quickly switch to partners of their own group. The refusal to accept another

partner and the aggressive virtuosity of the following mambo seem to have prepared the violent dance styles of the later punk-scene. The choreography of "Tonight" again separates the hostile groups while the music reveals their common features.

c. In Sylvester Levay's *Elisabeth*, the dance of the aristocrats shows the obligation of their social status together with the strategy of their intrigue. "Wir oder sie" displays the plan of the archduchess Sophie and the court camarilla as a game, danced on a chessboard, in which they decide to let the empress be infected with syphilis in order to eliminate her political influence on her husband.

d. In Andrew Lloyd Webber's *The Phantom of the Opera*, the great masquerade alludes to Giuseppe Verdi's opera *Un ballo in maschera* and allows the Phantom to join the festivity hidden under his mask.

10. Show dance:

a. Synchronous dance shows the uniformity of a group. Revues and shows compete with their longest possible lines of similarly dancing girls and boys. The thirty-two girls in *Qi – Eine Palast-Phantasie* at the Berlin Friedrichstadtpalast are stated to be the longest girl-line of the world. Marvin Hamlish's *A Chorus line* treats an audition as a process to select dancers who could dispense with their artificial individuality in order to form a line of accurately moving dancers.

b. John Kander's musical *Chicago* recalls Elvis Presley's success in Richard Thorpe's film *Jailhouse Rock* (1957) by presenting two murderesses as show singers and dancers. The vaudevillian Velma Kelly, who murdered her adulterous husband and her

sister, had to rival Roxie Hart, who murdered her lover and compelled her husband to pay her attorney. In jail, where the murderesses dance the "Cell Block Tango", Roxie steals Velma her limelight and also her lawyer. After a fierce quarrel, both decide to team up in "Nowadays/Hot Honey Rag" what enhances their success.

c. Erotic dancing in musicals showcases the female appeal as well as a sexual objectification of women. Claude-Michel Schönberg's musical *Miss Saigon* starts with "The heat is on in Saigon", a song of the bar girls at the night club "Dreamland" who dance to attract the GIs of the American occupying army. The club's boss urges the girls to prostitute themselves for his profit. Their song "The movie in my mind" describes their dream of marriage and immigration in the USA, while they embrace the harsh guys. The impact of the regular prostitutes' movements contrasts the naivety of the newcomer Kim. This peasant girl, traumatized by her parent's napalm death, is sold as a virgin to the best bidding client and 'bought' by John for his friend Chris. Kim and Chris fall in love, and their tenderness opposes the prostitute's offensive sex appeal.

The Paris variety theatre Moulin Rouge became famous for its performances of the cancan. After Cole Porter's musical *Can Can* (1953), this dance appears again in Baz Luhrmann's film and musical *Moulin Rouge.*

d. Besides physical prostitution musicals also depict aesthetic prostitution. In Maury Yeston's musical *Nine*, the director Guido Contini has to shoot a new movie but cannot produce a script, he does not even have an idea for it. The crew gathers in Cinecittà and expects a new sensation. As Contini tries to avoid his humiliation, the women, who always fed his vitality and creativity and now want to be part of the new production, present themselves and their ideas in songs and dances.

Starlight Express, stunt skaters © Jens Hauer, BestPicture

    e. A show performance ending up in a delicate form of exhibitionism is Meg Giry's turn "Bathing Beauty" in Andrew Lloyd Webber's *Love Never Dies*. She sings and dances at the Coney Island fairground to attract visitors but she also hopes in vain to impress the secretly beloved Phantom.

11. Movements using technical equipment:

    a. Since 1984, roller skates and in-line skates are ingredients of the longest running musical, Andrew Lloyd Webber's *Starlight Express.* It tells stories of trains – including rusty engines –, performed by actors who sing and dance while running up and down on their skates along the tracks of a huge stage space. Since 2006, additional stunt skaters fill the time of the alterations of the stage with acrobatic jumps and saltos.

b. Heelys, the rolling shoes, have been used in Ulrike Kaufmann's and Erwin Piplits's *Follow me 2 – School of Night.*

c. Dancing on ice is not only an Olympic sport, but also the special feature of the great ice shows like *Holiday on Ice* and others. Theatres can only present dances with ice skates if they can set up an icy surface on their stage. Therefore, they only appear in exceptional shows of special variety theatres like Friedrichstadtpalast in Berlin, where *Qi – Eine Palast-Phantasie* presented dances on ice.

d. *Qi – Eine Palast-Phantasie* had an act of bicycles and unicycles dancing on stage. Bicycles also appeared in the 1994 production of Ralph Benatzky's *Im weißen Rössl am Wolfgangsee*[9] at the Bar jeder Vernunft in Berlin.

e. The Cyr wheel has been used in *Cléopâtre, la dernière reine d'Égypte.*

f. Motorbikes and a car came on stage in Jim Steinman's *Bat out of Hell.*

12. Aquacades:

The Romans flooded their amphitheaters to stage sea battles. After 1591, Vincenzo Scamozzis Teatro all'antica in Sabbioneta and after 1618, Giovanni Battista Aleotti's Teatro Farnese in Parma allowed more than 3000 people to witness sea battles on stage.

a. Water on stage is increasingly popular. In Konstantin Wecker's musical *Ludwig*[2], the "Festspielhaus Neuschwanstein" offered a wide lake for King Ludwig II to commit his drowning suicide.

b. A special effect impressed the audience in *Qi – Eine Palast-*

Phantasie, when a huge luster was hoisted from the large water pool with dancers/acrobats inside who started their synchronous choreography already in the water.

    c. In shallow stage pools, choreographies also play with splashing water like in *Cléopâtre, la dernière reine d'Égypte*.

    d. Fountains dancing with the music (like in front of the hotel Bellagio in Las Vegas) became a medley-effect of the lake stage of Mörbisch after the performance of Emmerich Kálmán's operetta *Gräfin Mariza* since 2018.

13. Aerial acrobatics:

400 years after Nicola Sabbatini's flying machinery which let the miraculous Deus ex machina descend from the flyspace, travelers belong to every normal theatre equipment. The extravaganza as one of the roots of the musical burdened it with a special heritage. Following the spectacular feats of Le Cirque du Soleil, aerial acrobatics became a widespread part of theatrical performances. Trapezes and trampolines mostly appear in shows, aerial silks and aerial straps also in musicals.

    a. For the aerial acrobatics of "The Flying Cranes" in *Qi – Eine Palast-Phantasie*, Frank Nimsgern composed the music in close contact with the acrobats, who, while performing in Las Vegas, sent him videos of their latest elaborated sequences of the choreography so that he could fit his music perfectly into the dynamics of their movements.

    b. In *Cléopâtre, la dernière reine d'Égypte*, the acrobats use aerial silks and aerial straps. Their flight acts visualize the culture of the Egyptians as superior to that of the Romans. In her duet with Marc Antoine, Cléopâtre, the queen and daughter of the divine pharaoh,

flies in beautiful ornaments over Antoine's head, while he stays on the floor. In the back, male acrobats are attached to a vertical brown flat symbolizing the slaves of whom both cultures take advantage.

c. In Phil Collins's musical *Tarzan*, the gorillas swing on aerial cords and elastic straps like on lianas in the jungle. The aerial designer Pichón Baldinu created these eye-popping feats of bungee jumping.

d. In Rahman's, Värttinä's and Nightingale's musical *The Lord of the Rings*, the queen of the elves, Galadriel, swings in an aerial silk that depicts the status of her supernatural power. She sings "Oh child of my heart" to support the hobbits on their quest.

e. In *Paramour*, Le Cirque du Soleil created a hybrid of a musical and circus acrobatics. The plot tells of a director rehearsing a show in which he has to reshuffle the female character. In a night club, he finds a singer performing the songs of her unsuccessful composer friend and falls in love with her. The show presents almost continuous acrobatics. The acrobats move in aerial straps, jump on trampolines and boards that fling them into the air, a unicyclist balances a woman on his head, and the straps duo Andrew and Kevin Atherton perform breathtaking aerial acrobatics even above the audience.

14. Movements and dances of pictorial elements:

The technology of new media allows remarkable speedups of the succession of sequences in movies. The audience became accustomed to fast and multiple impressions, even to subliminals, and to virtual reality experiences. So, without visual impact the spectators easily feel bored. On stage, Mauricio Kagel had the set and props move and dance in his "instrumental theatre".[10] Since then, new techniques for altering the set have been developed.

a. Moving lights in different colours, flashes, strobe lights and mirror balls change the appearance of the set and the actors.

b. Drones equipped with lights can be programmed to write words, paint pictures or let stars dance in the air. In open air performances, up to more than thousand drones can perform choreographies. In China EHang Egret's 1374 drones danced over the City Wall of Xi'an.[11] In theatre buildings, the number of drones involved depends on the range of spaces free from flies and backdrops.

c. Cameras on stage multiply the actors, and the real persons interact with their projections on screens while their movements create tensions and interpretations of the action. Projections of actions which happen behind screens visualize changing spaces for the actors on stage. For the musical *Ghost*,[12] the projections created indoor and outdoor spaces, and the swift changes of moving masses followed a special rhythm that made passengers on the street move as if performing a choreography.

d. An interactive stage set was created by Joachim Sauter and ART+COM for André Werner's *Marlowe: Der Jude von Malta*.[13] A Normandy bunker was filmed from inside, and the sequences were transformed into an outside view to visualize the powerbase of the Jew which fell apart in his decay when he lost his power. With his movements, the protagonist changed the visual ambience projected on three screens. The walls of the bunker finally dissolved, and a quick chaotic flickering seemed to flail at the tyrant. The colours and swatches of the costumes were projected onto the singers and changed with the moods of the characters and their political status.

e. Klaus Obermaier's audiovisual performance of Stravinsky's *Le Sacre du Printemps* focused on "nonverbal communication with

facial and corporeal expressions and paralanguage and [...] the human body as the interface between the real and the virtual. [...] The live interaction between sound, movement, gestures, voice and visuals form an immersive environment, where the body talks, the face screams, the visuals sound and the voice cracks."[14] The movements and looks of the real dancer on stage were virtualized into multiple body fragments, into dances on virtual moving floors according to the input of the dancer's movements and the musical performance of the orchestra. Obermaier triggered the virtual output of this real-time generated stereoscopic projection live during the performance in front of the audience.

f. In 1998, Robert Wilson engaged Jed Wheeler to work on a creation of 3D computer graphics for the production of Philip Glass's *Monsters of Grace*.[15] The aim was a surreal, visionary pictorial world for the mystic Sufi poetry of Jalaluddin Rumi. Searching for adequate visualizations of Wilson's visual concept of the opera, producer Jed Wheeler visited MASS MoCA. Diana Walczak suggested to use stereoscopic film and computer animation to create a virtual stage, scenery and actors. Together with Jeff Kleiser, she directed 73 minutes of a computer-generated stereoscopic imagery. Their "digitally animated stereoscopic film transforms the traditional stage with prologues, landscapes, still lives and portraits, conceived by stage director Robert Wilson, filling space through projection into three dimensions."[16]

g. After the great success of the play *Die Borderline Prozession*,[17] the director Kay Voges asked Björn Lengers and Marcel Karnapke, the artist collective "CyberRäuber", to produce a visual documentation of the production. The task was to cope with the abundance and simultaneity of the stage, text, music and actions of 23 actors during the three-hours performance in the multiple

Memories of Borderline, 3D visions © CyberRäuber / Schauspiel Dortmund

setting of a house with ten rooms, roof deck, garage, pool and further outside areas. In their 'documentation', "CyberRäuber" created a new form of hybrid art, a combination of graphic and media art, gaming and performing arts. It explored the possibilities of theater in and with new technologies and starts a new theatre narrative: The users create their special perspectives, thus becoming their own narrators, while the VR experience drags them into a narration of memories and transiency. "CyberRäuber" produced the 3D visions performance *Memories of Borderline*[18] working with laser scans of the set of *Die Borderline Prozession*, actors were recorded volumetrically, 360 degree and 180 degree videos and stills were made. 30 laser scan positions in a 14 000 square meters scan area, 3 billion coordinates and 1 billion polygones, 25 000 photos as textures and 47 actors as hologram scan were used.

h. In 2019, Björn Lengers and Marcel Karnapke created their interactive VR opera *Fragments | a digital Freischütz*.[19] Four head-mounted displays allowed four participants to surf through four virtual environments which "CyberRäuber" had prepared as 360° sceneries to be explored. So, the spectators created their own special visual experience to accompany the prefixed music which they heard in their earphones: a compilation of original parts of Carl Maria von Weber's *Der Freischütz* embedded in digital soundscapes and variations in the styles of pop, 'dark' and ambient. Episode A[20] focusses on the spooky Wolf's glen with motives of "Milch des Mondes", followed by Kaspar's aria „Schweig!, schweig, damit dich niemand warnt", and interrupted by the song of the bridesmaids. The VR offers a roller coaster ride through brier woods, where the spectator, crossing the red stripes, could feel to be cut into pieces. The path passes by the dancing and singing bridesmaids and reaches three huge statues of the demonic Kaspar. Episode B starts in a theatrical forest scenery leading to a labyrinth of screens with thunderstorm-, newsreel- and AI-generated projections, and ending up in a huge point cloud statue of Ännchen who sings her horror ballad in a compilation with motives from the overture and the hunter's choir. Episode C guides the spectator through a 180° forest video accompanied by the choir "Milch des Mondes". A white point cloud depicts the forester's house which is mirrored underneath in a red point cloud, where the spectator may feel to get lost while Agathe tries to tame her fear with her aria "Leise, leise, fromme Weise" that switches to a dark variation. Episode D shows the protagonist Max singing "Ha, furchtbar gähnt der düstre Abgrund" in an expressionistic mountain landscape and sinking into a bottomless depth. Then, like in terms of an alienation effect that dissolves the illusion, the protagonists appear as if frozen in a point cloud forest, followed by the auditorium of the opera house. At last, the user flies through a cloud of sheets of Weber's autographic score and may stop to read the notes.

i. *Silicium 04* is created in a mixed reality space by the visual artist Carl Emil Carlsen and the electronic music composer and performer Bjørn Svin as a live controlled interplay between improvised actions and music which in parts is also improvised. The performance works with a "Peppers Ghost stage" with stereoscopic 3D projections which the audience sees through 3D glasses. "A highly variable particle simulation form the basis of graphic structures, patterns and behaviors, rendered as a synthesis of spheres and volumetric lines throughout the performance. Imitating both atomic, molecular, organic, architectural and celestial qualities it displays a complex spectrum of expression in a minimal interpretation."[21] The actors on stage are surrounded and involved in changing 3D computer graphics which respond to their acting and create "a surreal music experience that focuses on interplay between graphics, music and performative presence. Music and visuals appear as a coherent whole, – an audiovisual instrument –, a musical living synthetic space where the physical meets the purely abstract. *Silicium*'s output often puts the receiver in a focused and challenging state of transcendence."[22]

j. For *Chronicle of Light Year*,[23] the media artist Chou Tung-Yen used a "4D box hologram to create a majestic and immersive scenography for the peripatetic story of two time travelers and their intimate memories light-years away."[24] The 4D Box is a multimedia digital live-stage, which combines the technology of holograms, sound and live-performance in the same space, so that the locations of the two protagonists' memories appear as visual environments while they speak and move on stage. The holograms disappear when new images come to the speakers' minds and new holograms appear in their surroundings. The reflections about the ephemeral states of happiness transcend limits of time and space like in dreams or visions.

Chronicle of Light Year © Lin Terry/Very Theatre

Noora Hannula vs. Soma The Augmented-Reality Girl: The Ultimate Battle © Søren Meisner

k. 2017 had been labelled as the year of Virtual Reality, 2018 as the year of Augmented Reality.[25] Noora Hannula together with The Nordic Beasts, The Culture Yard and Bora Bora created the dance performance *Noora Hannula vs. Soma The Augmented-Reality Girl: The Ultimate Battle*.[26] The performance shows a competition of a real dancer and an avatar, the dancer's virtual alter ego. The plot treats the jealousy of a woman who assumes her boyfriend to have fallen in love with his creation, a female avatar. She calls her Soma and challenges the 3D animated virtual figure to a battle like groups of street dancers compete with others in their 'battles'. Noora's struggle against Soma bursts into aggressive attacks of increasing brutality. "Inspired by the most popular game heroines, this dead-hardcore, dead-funny physical dance performance will be showcasing the gravity of the reality in an art of the impossible, as the human character Noora mimics flight sequences, extreme martial arts and erotic clichés in this grotesquely embodied attempt to beat staged 3D reality."[27]

Visualizations of virtual reality or augmented reality which interact with real persons on stage create a new kind of theatrical experience by making memories, artifacts, phantasms or even visions of the impossible come alive.

Appendix

Musicals and Shows

3 Musketiers, de Musical, music: Rob[ert] and Ferdi Bolland, book: André Breed-land (based on the novel *Les trois Mousquétaires* of Alexandre Dumas, père, 1844), lyrics: Rob[ert] and Ferdi Bolland, Paul Bogaev, Gerard Cox, Jan-Simon Minkema, Petra van der Eerden, choreography: Anthony Van Laast, Rotterdam, Nieuwe Luxor Theater 2003. DVD: Universal Stage Music.

42nd Street, music: Harry Warren, book: Michael Stewart, Mark Bramble (based on Lloyd Bacon's film *42nd Street*, 1933), lyrics: Al Dubin, Johnny Mercer and Mort Dixon, choreography: Gower Champion, New York, Winter Garden Theatre 1980.

A Chorus Line, music: Marvin Hamlisch, book: James Kirkwood and Nicholas Dante (based on Michael Bennett's idea, who choreographed and directed the performance), lyrics: Edward Kleban, world premiere: New York, The Public Theatre 1975.

An American in Paris, musical version (based on Vincente Minelli's film *An American in Paris*, using the book of Craig Lucas, lyrics of Ira Gershwin and music of George Gershwin, choreography: Gene Kelly, USA 1951), choreography: Christopher Wheeldon, Paris, Théâtre du Châtelet 2014.

Bat out of Hell, music, book, lyrics: Jim Steinman (based on Meat Loaf's album *Bat out of Hell*), choreography: Emma Portner, world premiere: Manchester, Manchester Opera House 2017.

Beauty and the Beast, music: Alan Menken, book: Linda Woolverton, lyrics: Howard Ashman, Tim Rice (based on the film *Beauty and the Beast*, USA 1991), choreography: Matt West, world premiere: New York, Palace Theatre 1994.

Billy Elliot – The Musical, music: Elton John, book, lyrics: Lee Hall (based on the film *Billy Elliot – I Will Dance*, choreography: Peter Darling, Universal Pictures/Studio Canal, UK 2000), choreography: Peter Darling, world premiere: London, Victoria Palace Theatre 2005. DVD: Universal City Studios 2014.

Can-Can, music, lyrics: Cole Porter, book: Abe Burrows, choreography: Michael Kidd, world premiere: New York, Shubert Theatre 1953.

Cats, music: Andrew Lloyd Webber, book, lyrics: T.S. Eliot, Trevor Nun (based on T. S. Eliot: *Old Possum's Book of Practical Cats*), choreography: Gillian Lynne, world premiere: London, New London Theatre 1981; film/ DVD: directors: Tom Hooper and Lee Hall, choreography: Andy Blankenbuehler, production: Working Title Films, Amblin Entertainment, Perfect World Pictures, Monumental Pictures, The Really Useful Group, distribution: Universal Pictures International, USA/UK 2019.

Chicago, music: John Kander, book: Fred Ebb, Bob Fosse (based on Maurine Dallas Watkins's *Chicago*, 1926), lyrics, choreography: Bob Fosse, world premiere: New York, 46th Street Theatre, 1975. Film: director: Rob Marshall, USA 2002. DVD: Miramax, Buena Vista Home Entertainment 2003.

Rodgers + Hammerstein's Cinderella, tv-musical, music: Richard Rodgers, book, lyrics: Oscar Hammerstein II (based on Charles Perrault's *Cendrillon*, 1697), choreography: Jonathan Lucas, USA 1957.

Cléopâtre, la dernière reine d'Égypte, mise en scène, choreography: Kamel Ouali, music: Fabien Dubos, Davide Esposito, Souad Massi, Laure Milan, Benoit Po-her, Vegastar, lyrics: Lionel Florence, Patrice Guiaro, Agnes Hampartzoumian, world premiere: Paris, Palais des Sports 2009. DVD: Universal Music France, CLN Spectacles 2010.

Dancer in the Dark, screenplay and film: Lars von Trier, music: Björk, DK/D/ NL/USA/UK/S/IS/F/FIN/N 2000. DVD: Warner Home Video 2004, ASIN : B0002KVM9Q.

Dirty Dancing, music: John Morris, book, lyrics: Eleanor Bergstein (based on the film *Dirty Dancing*, script: Eleanor Bergstein, director: Emile Ardolino, Great American Films Limited Partnership, Vestron Pictures, USA 1987), world premiere: Sydney, Theatre Royal 2004.

Dracula – The Musical, music: Frank Wildhorn, book, lyrics: Don Black, Christopher Hampton (based on Bram Stoker's *Dracula*, 1897), world premiere: La Jolla, California, La Jolla Playhouse 2001.

Dreamgirls, music: Henry Krieger, book, lyrics: Tom Eyen, choreography: Michael Bennett, Michael Peters, world premiere: New York, Imperial Theatre, 1981. Film directed by Bill Conden, DreamWorks, Paramount Pictures, Laurence Mark Productions, USA 2006.

Elisabeth, music: Sylvester Levay, book, lyrics: Michael Kunze, choreography: Dennis Callahan, world premiere: Wien, Theater an der Wien 1992. DVD: Live-recording at Theater an der Wien, A 2005, MG-Sound 2006, ASIN: B000IU3XGA

Evita, music: Andrew Lloyd Webber, book: Jim Rice, choreography: Larry Fuller, world premiere: London, Prince Edward Theatre 1978. Film version: director: Allan Parker, USA 1996, DVD: CIC Video/Paramount Home Entertainment 2003, ASIN: B0000691LW.

Eubie!, music: Eubie Blake, lyrics: Noble Sissle, Andy Razaf, Johnny Brandon, F.E. Miller, Jim Europe, choreography: Billy Wilson, Henry LeTang, director: Julianne Boyd, New York, Ambassador Theatre 1978.

Fame – The Musical, music: Steve Margoshes, book: José Fernandez, lyrics: Jacques Levy (based on the film *Fame*, with conception by David De Silva; music:

Michael Gore, script: Christopher Gore, choreography: Louis Falco, Metro-Goldwyn-Mayer, USA 1980), choreography: Jennifer Muller, world premiere: Miami, USA 1988.

Flashdance – The Musical, (based on Adrian Lyne's film *Flashdance*, script: Thomas Hedley, Joe Eszterhas, music: Giorgio Moroder, USA 1983, DVD: Paramount Pictures, PolyGram Filmed Entertainment, Don Simpson/Jerry Bruckheimer Films 1983) lyrics: Robbie Roth, Robert Cary, additional music: Robbie Roth, choreography: Jennie Widegren, world premiere: Plymouth, Theatre Royal 2008.

Follow me2 – School of Night, Serapions Ensemble, directors: Ulrike Kaufmann, Erwin Piplits, lyrics: based on Alexander Puschkin, Marina Zwetajewa, Ossip Mandelstam, Arsenij Tarkowskij, music: Nour Ensemble, Goran Bregovic, Zarbang, Sainkho Namtchylak, Roysten Abel, choreography: José Antonio Rey Garcia and Mario Mattiazzo, Wien 26.9.2009.

Footloose, music: Tom Snow, book: Dean Pitchford, Walter Bobbie (based on Herbert Ross's film *Footloose*, script: Dean Pitchford, music: Kenny Loggins, USA 1984, DVD: Paramount Pictures, Phoenix Pictures, IndieProd Company Productions. Remake: director: Craig Brewer, script: Dean Pitchford, Craig Brewer, music: Deborah Lurie, DVD: Paramount Pictures, Spyglass Entertainment, Dylan Sellers Productions, Zadan/Meron Productions, Weston Pictures, MTV Films, USA 2011), lyrics: Dean Pitchford with additional lyrics by Kenny Loggins, choreography: AC Ciulla, world premiere: New York, Richard Rodgers Theatre 1998.

Ghost – The Musical, music, lyrics: Dave Stewart, Glen Ballard, book: Bruce Joel Rubin (Based on Jerry Zucker's film *Ghost*, script: Bruce Joel Rubin, Paramount Pictures, Howard W. Koch Productions, USA 1990), choreography: Ashley Wallen, world premiere: Manchester, UK 2011.

Grease, music, book, lyrics: Warren Case, Jim Jacobs, choreography: Patricia Birch, world premiere: Chicago 1971. Film adaptation: director Randal Kleiser, script: Allan Carr, Bronte Woodard, music: John Farrar, Barry Gibb, USA 1978, DVD: Paramount Pictures, Robert Stigwood Organization, Allan Carr Production USA 1978.

The King and I, music: Richard Rodgers, book, lyrics: Oscar Hammerstein II (based on Margaret Landon's novel *Anna and the King of Siam*, 1944), choreography: Jerome Robbins, world premiere: New York, St. James Theatre 1951.

Les Misérables, music: Claude-Michel Schönberg, book: Alain Boublil (based on Victor Hugo's *Les Misérables*), choreography: Arthur Plasschaert, world premiere: Paris, Palais des Sports 1980. Film adaptation: director: Tom Hopper, script: William Nicholson, Alain Boublil, Claude-Michel Schönberg, Herbert Kretzmer, Universal Pictures, Working Title Films, Cameron Mackintosh, Relativity Media, UK 2012.

The Lion King, book: Roger Allers, Irene Mecchi (based on *The Lion King*, music: Hans Zimmer, Elton John. Lebo M[orake], script: Irene Mecchi, Jonathan Roberts, Linda Woolverton, production: Walt Disney, USA 1993), lyrics, music: Elton John, Tim Rice, additional music and lyrics: Lebo M[orake], Mark Mancina, Jay Rifkin, Julie Taymor, Hans Zimmer, choreography: Garth Fagan, world premiere: New York, New Amsterdam Theatre, Minskoff Theatre 1997. DVD not yet available; clips of the German production in Hamburg: Ensemble Musical König der Löwen – "Der ewige Kreis & Kann es wirklich Liebe sein", 2015: https://www.youtube.com/watch?v=HSDNx-wvj7Y [last access: 19.12.2020].

Lord of the Rings, music: Alla Rakha Rahman, Värttinä, Christopher Nightingale, book, lyrics: Matthew Warchus, Shaun McKenna (based on J.R.R. Tolkien's *The Lord of the Rings*, 1954/1955), director: Matthew Warchus, choreography: Peter Darling, world premiere: Toronto, Princess of Wales Theatre 2006.

Love never dies, music: Andrew Lloyd Webber, book: Glenn Slater, Charles Hart (based on Frederick Forsyth: The Phantom of Manhattan, 1999), choreography: Jerry Mitchell, world premiere: London 2010. DVD: directors: Brett Sullivan, Simon Philips, Universal Studios Home Entertainment, USA 2012.

Ludwig², music: Konstantin Wecker, Christopher Franke, Nic Raine, book, lyrics: Rolf Rettberg, choreography: Sylvia Hase, world premiere: Füssen, Festspielhaus Neuschwanstein 2005.

Mamma Mia!, music: ABBA (Benny Andersson, Björn Ulvaeus, Stikkan Anderson), book: Catherine Johnson, choreography: Anthony Van Laast, world premiere: London Prince Edward Theatre 1999. DVD: Film script: Catherine Johnson, director: Phyllida Lloyd, production: Universal Pictures, Relativity Media, Littlestar (co-production) Playtone (co-production), Internationale Filmproduktion Richter, USA/UK/D 2008.

Miss Saigon, music: Claude-Michel Schoenberg book: Alain Boublil (based on Pièrre Loti's *Madame Chrysanthème*, 1887, John Luther Long's *Madame But-*

terfly, 1898, David Belasco's *Madame Butterfly. A Tragedy of Japan*, 1900, and
Giacomo Puccini's *Madama Butterfly*, 1904), choreography: Bob Avian, world
premiere: London, Theatre Royal Drury Lane 1989. DVD: *Miss Saigon: 25th
Anniversary Gala*, director: Brett Sullivan, Prince Edward Theatre London,
production: Cameron Mackintosh International, UK 2016.

Moulin Rouge, music, lyrics: various artists, book: John Logan (based on *Moulin
Rouge!*, film by Baz Luhrmann, script: Baz Luhrmann, Craig Pearce, mu-
sic: Craig Armstrong, Marius de Vries, Anu Malik, choreography: Sonya
Tayeh, USA/UK/AUS 2011), world premiere: Boston, Emerson Colonial
Theater 2018. DVD: Twentieth Century Fox Home Entertainment 2001, EAN:
4010232036810.

My Fair Lady, music: Frederick Loewe, book, lyrics: Alan Jay Lerner (based on
George Bernard Shaw's *Pygmalion*, 1912), choreography: Hanya Holm, world
premiere: New York, Mark Hellinger Theatre 1956.

Nine, book: Arthur Kopit (based on Federico Fellini's film *8 ½*), music, lyrics:
Maury Yeston, director: Tommy Tune, choreography: Thommie Walsh, world
premiere: New York, 42nd Street Theatre, 1982. DVD: director: Rob Marshall,
script: Arthur Kopit, Maury Yeston, Mario Fratti, Anthony Minghella, Michael
Tolkin, The Weinstein Company, Relativity Media, Marc Platt Productions, Lu-
camar Productions, Jac Film and Television, Guido Contini Films, USA/I 2009.

Oklahoma!, book, lyrics: Oscar Hammerstein II, music: Richard Rodgers (based
on Lynn Riggs's *Green Grow the Lilacs*), choreography: Agnes de Mille, world
premiere: New York, St. James Theatre 1943. DVD: screen play: Sonya Levian,
William Ludwig, choreography: Agnes de Mille, director: Fred Zinnemann,
production: Rodgers & Hammerstein Productions, USA 1955.

On the Town, music: Leonard Bernstein, book, lyrics: Betty Comden, Adolph Green
(based on their ballet *Fancy Free*, 1944), choreography: Jerome Robbins, world
premiere: New York, Adelphi Theatre 1944.

Paramour, music: Guy Dubuc, Marc Lessard, Andreas Carlsson, book: West
Hyler, lyrics: Andreas Carlsson, director: Philippe Decouflé, choreography:
Daphné Mauger, flying machine design and choreography: Verity Studios,
acrobatic performance design: Shana Carroll and Boris Verkhovsky, rigging
and acrobatic equipment design: Pierre Masse, world premiere: New York,
Lyric Theatre 2016. For the 2019 production in Hamburg, Neue Flora, the cast

changed. Trailer: https://www.youtube.com/watch?v=qNaEwOwQu-Q [last acceesss: 19.12.2020].

The Phantom of the Opera, music: Andrew Lloyd Webber, book: Richard Stilgoe, lyrics: Charles Hart, Richard Stilgoe, Mike Batt (based on Gaston Leroux's *Le fantôme de l'opéra*, 1910), choreography: Gillian Lynne, world premiere: London, Her Majesty's Theatre 1986. DVD Special Edition: Concorde Video 2010, ASIN: B003US2NRM.

Qi – Eine Palast-Phantasie, music: Frank Nimsgern, book: Jürgen Nass, Roland Welke, lyrics: Aino Laos, choreography: Sean Cheesman, Maik Damboldt, Alla Duhova, Patrick King, aerial acrobatics: The Flying Cranes, world premiere: Berlin, Friedrichstadtpalast 9.10.2008.

The Rocky Horror Picture Show, music, lyrics: Richard O'Brien, book: Richard O'Brien, Jim Sharman, world premiere: London, The Royal Court Theatre Upstairs 1973. Film adaptation: director: Jim Sharman, USA 1975, DVD: Twentieth Century Fox Home Entertainment, ASIN: B00006NSCI.

Saturday Night Fever, music, lyrics: Bee Gees, book: Nan Knighton, Arlene Philips, Paul Nicholas, Robert Stigwood (based on the movie by Paramount International, director: John Badham, 1977), choreography: Arlene Philips, world premiere: London, London Palladium 1998.

Starlight Express, music: Andrew Lloyd Webber, book: Andrew Lloyd Webber, Richard Stilgoe (based on Reverend Wilbert Awdry's *Railway Series*, 1945/1972, and Watty Piper's *The Little Engine That Could*, 1930), lyrics: Richard Stilgoe, choreography: Arlene Philips, world premiere: London, Apollo Victoria Theatre 1984. Live recording Bochum 2014: https://www.youtube.com/watch?v=dupO9wvIHIw&list=PL8PNrpB0VqqMS6IyfWj0Hrn_zpF1a08zz [last access: 19.12.2020].

Street dance, script: Jane English, music: N-Dubz, Sergej Prokofiev's ballet *Romeo and Juliet*. Director: Max Giwa, Dania Pasquini, choreography: Kate Prince, Kenrick Sandy, UK 2010. DVD: Vertigo Films, BBC Films, Little Gaddesden Productions 2010.

Strictly Ballroom – The Musical (adaptation of Baz Luhrmann's 1992 film *Strictly Ballroom*), book: Baz Luhrmann, Craig Pearce (based on his film *Strictly Ballroom*, music and lyrics: various, book: Baz Luhrmann, premiere: Sydney 2014), music, lyrics: various, choreography: John O'Connell, world premiere: Sydney, Sydney Lyric, 2014. DVD: Alive Vertrieb und Marketing/DVD 2009, ASIN: B002NUZBWC.

T*anz der Vampire*, music: Jim Steinman, book, lyrics: Michael Kunze (based on Roman Polanski's *The Fearless Vampire Killers*, 1967, which is based on Bram Stoker's *Dracula*), choreography: Dennis Calahan, world premiere: Wien, Raimundtheater (Vereinigte Bühnen) 1997. Video: Neue Wiener Fassung, https://www.youtube.com/watch?v=i-_pID9CIKw&list=PL7204A295C9E06FD1 [last access: 19.12.2020].

Tarzan, music, lyrics: Phil Collins (based of Edgar Rice Burroughs's *Tarzan of the Apes*, 1912, and the Disney movie *Tarzan*, script: Tab Murphy, music: Mark Mancina, songs: Phil Collins, directors: Kevin Lima, Chris Buck, USA 1999), aerial acrobatics: Pichón Baldinu, choreography: Meryl Tankard, world premiere: New York, Richard Rodgers Theatre 2006. Clips of the aerial acrobatics as presented in the tv-show Verstehen Sie Spaß?, 11.12.2010, https://www.youtube.com/watch?v=dzMQEnb5S_A&list=RDhcORe71UZXI&index=8 [last access: 19.12.2020].

Top Hat, music: Irving Berlin, script: Allan Scott, Dwight Taylor, director: Mark Sandrich, choreography: Fred Astaire, Hermes Pan (starring Fred Astaire, Ginger Rodgers), USA 1935. Video clip of "Heaven" https://www.youtube.com/watch?v=ILxo-TUkzOQ [last access: 19.12.2020].

Victor/Victoria, music: Henry Mancini with three additional titles by Frank Wildhorn, book: Blake Edwards, lyrics: Leslie Bricusse (based on the film *Viktor und Viktoria*, director: Heinhold Schünzel, music: Franz Doelle, D 1933, and the film Victor/Victoria, script, director: Blake Edwards, Hans Hoemburg, music: Henry Mancini, USA/UK 1982), choreography: Merle Tankard, world premiere: New York, Marquis Theatre 1995. Video: https://www.youtube.com/watch?v=qGIxw77_YsY [last access: 19.12.2020].

We will rock you, music, lyrics: Queen; Under Pressure with David Bowie, book: Ben Elton, choreography: Arlene Phillips, world premiere: London, Dominion Theatre 2002. Video: https://www.youtube.com/watch?v=Ew9KR1zZXzk [last access: 19.12.2020].

West Side Story, music: Leonard Bernstein, Stephen Sondheim, book: Stephen Sondheim, Sid Ramin, Irwin Kostal, lyrics: Stephen Sondheim, choreography: Jerome Robbins, world premiere: New York, Winter Garden Theatre 1957. DVD: MGM 1961.

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Susanne Vill: „Spielräume zwischen Medienkunst und Virtueller Realität", in: Henri Schoenmakers/Stefan Bläske/Kay Kirchmann/Jens Ruchatz (eds.),

Theater und Medien/Theatre and the Media. Grundlagen – Analysen – Perspektiven. Eine Bestandsaufnahme. Bielefeld: transcript 2008, pp. 457–477.

Susanne Vill, „Virtuelle Oper und Medienperformance – eine zukünftige Alternative?", in: Manfred Jochum/Isolde Schmid-Reiter (eds.), *Teure Kunstform Oper. Musiktheater im neuen Jahrtausend. Strategien und Konzepte*, Innsbruck: Studien-Verlag 2006 (Europäisches Forum Alpbach/Europäische Musiktheater-Akademie), pp. 117–126.

Agrippina J. Waganowa, *Die Grundlagen des klassischen Tanzes*, Wilhelmshaven: Heinrichshofen ⁵1979.

Richard Wagner, *Das Kunstwerk der Zukunft*, Leipzig: Wigand 1850.

Annotations

[1] Theodoros Terzopoulos in *Im Schatten des Dionysos. Das Antikenprojekt des Schauspiels Düsseldorf in Epidaurus 2000*, 3Sat 2000, 60'. Theodoros Terzopoulos about Euripides *The Bacchae*. Theodoros Terzopoulos's workshop for *The Bacchae* by Euripides: https://www.youtube.com/watch?v=XyjRdAOXa-A&list=PLwSOqUVccA4gBaoQGv-b1-ueTA4ga24jZ&index=97 [last access: 19.12.2020].

[2] Richard Wagner in *Das Kunstwerk der Zukunft* (Chapter II: Der künstlerische Mensch und die von ihm unmittelbar abgeleitete Kunst; 2.: Die drei reinmenschlichen Kunstarten in ihrem ursprünglichen Vereine): "Jene drei künstlerischen Hauptfähigkeiten des ganzen Menschen haben sich zum dreieinigen Ausdrucke menschlicher Kunst unmittelbar und von selbst ausgebildet, und zwar im ursprünglichen, urentstandenen Kunstwerke der Lyrik, sowie in dessen späterer bewußtvoller, höchster Vollendung, dem Drama Tanzkunst, Tonkunst und Dichtkunst heißen die drei urgeborenen Schwestern, die wir sogleich da ihren Reigen schlingen sehen, wo die Bedingungen für die Erscheinung der Kunst überhaupt entstanden waren. Sie sind ihrem Wesen nach untrennbar ohne Auflösung des Reigens der Kunst; denn in diesem Reigen, der die Bewegung der Kunst selbst ist, sind sie durch schönste Neigung und Liebe sinnlich und geistig so wundervoll fest und lebenbedingend in einander verschlungen, daß jede einzelne, aus dem Reigen losgelöst, leben-

und bewegungslos nur ein künstlich angehauchtes, erborgtes Leben noch fortführen kann, nicht – wie im Dreiverein – selige Gesetze gebend, sondern zwangvolle Regeln für mechanische Bewegung empfangend." – Richard Wagner, *Das Kunstwerk der Zukunft*, Leipzig: Wigand 1850, p. 43f. (online: http://www.digitale-bibliothek.de/band107.htm, S. 1130).

[3]   Hugo von Hofmannsthal and Richard Strauss, *Ariadne auf Naxos*, Klavierauszug, London: Fürstner 1912, 1916, 1940; Boosey & Hawkes 1943, p. 48; Haushofmeister: "Zudem ist mein gnädiger Herr schon seit drei Tagen ungehalten darüber, dass in einem so wohl ausgestatteten Hause wie das seinige, ein so jämmerlicher Schauplatz wie eine wüste Insel ihm vorgestellt werden soll, und ist eben, um dem abzuhelfen, auf den Gedanken gekommen, diese wüste Insel durch das Personal aus dem anderen Stück einigermaßen anständig staffieren zu lassen."

[4]   Cf. Thomas Siedhoff, *Handbuch des Musicals*, Mainz: Schott 2007, pp. 677-682; recent additions by Susanne Vill.

[5]   Cf. Internet Movie Database, https://www.imdb.com/title/tt5697572/fullcredits?ref_=tt_ov_wr#writers/ [last access: 19.12.2020].

[6]   Cf. Gerald Bordman, *American Musical Theatre. A Chronicle.* With updates by Richard Norton, New York/Oxford: Oxford University Press [4]2011, p. 861.

[7]   *Dancer in the Dark*, film by Lars von Trier, music: Björk, DK/D/NL/USA/UK/S/IS/F/N 2000.

[8]   Vernacular dances have been developed without formal instruction as a part of everyday life and culture in a particular community.

[9]   Ralph Benatzky, *Im weissen Rössl am Wolfgangsee*, directors: Geschwister Pfister, Bar jeder Vernunft, Berlin 1994, DVD: 3Sat, Studio Babelsberg, Zweites Deutsches Fernsehen (ZDF), BelAir 1994. Max Raabe sang "Im weissen Rössl am Wolfgangsee" while driving on the bicycle along the allays in the audience.

[10]   Mauricio Kagel, *Die Himmelsmechanik. Komposition mit Bühnenbildern* (1965), world premiere in Venice 1969. Dieter Schnebel wrote about "Musikdrama der Bühnenbilder", "Antiillusionistischer Aufführungsstil", and "Spiel von Illusion und Desillusion" in *Mauricio Kagel. Musik – Theater – Film,* Cologne: DuMont Schauberg 1970, pp. 173–175.

[11]   https://www.ehang.com/news/365.html   [last   access: 21.12.2020]   The performance achieved the Guiness World Records. Music: Buccaneer Island No Choir - Brand X Theatrical Music.

[12] Cf. http://ghostthemusical.com; Official trailer: https://www.youtube.com/watch?v=Sw5a5beiLSw&list=RDSw5a5beiLSw&start_radio=1&t=0, performed after the world premiere in Manchester in London, Piccadilly Theatre [last access: 19.12.2020].

[13] André Werner, *Marlowe: Der Jude von Malta,* Oper, Virtuelles/interaktives Bühnenbild, Kostümprojektionen: Nils Krüger, Andrè Bernhardt, Andreas Kratky, Bernd Lintermann, Joachim Sauter, Jan Schroeder, André Werner, world premiere: 8th München Biennale 2002, Muffathalle Munich; cf. http://at.zkm.de/node/272 [last access: 19.12.2020].

[14] Klaus Obermaier, interactive performances, e. g. *Le Sacre du Printemps*, music: Igor Strawinsky, dance, orchestra, real-time generated stereoscopic projection, world premiere: opening performance of the Bruckner Fest Linz and Classical Cloud of Sound Brucknerhaus and Danube park, Bruckner Orchestra Linz, conductor: Dennis Russell Davies, Linz, Austria, 2006. Video: http://www.exile.at/sacre/index.html [last access: 19.12.2020]. – *"FACELESS_VOICELESS,* is a continuously expanded series of works focussing on Klaus Obermaier's longterm artistic research in nonverbal communication with facial and corporeal expressions and paralanguage and moreover in the human body as the interface between the real and the virtual, as an object of constant redefinition and reinvention. – The live interaction between sound, movement, gestures, voice and visuals form an immersive environment, where the body talks, the face screams, the visuals sound and the voice cracks". Video and explanation: http://www.exile.at/audiovisual [last access: 19.12.2020], world premiere: Rome, Italy, Cinema Festival MACRO at the Museum of Contemporary Art 2017. *FACELESS*, opening performance of the exhibition ERROR 404: TERRITORIES OF ABSENCE, Bucharest, Romania National Museum of Contemporary Art 2017. – *SPECTRAL,* world premiere: Clujotronic - Electro Arts Festival, Cluj-Napoca, Romania, 2016.

[15] *Monsters of Grace*, multimedia chamber opera in 13 short acts, music: Philip Glass, lyrics: Jalaluddin Rumi, director: Robert Wilson, 3D computer graphics: Jew Wheeler with Kleiser-Walczak Construction Co, world premiere: Los Angeles, Royce Hall, 1998.

[16] https://web.archive.org/web/20010309233334/; http://www.kwcc.com/works/sv/mog.html [last access: 4.10.2019]; see also: https://web.archive.

org/web/20010309233334/http://www.kwcc.com/works/sv/mog.html [last access: 21.12.2020]

17 *Die Borderline Prozession*, directed by Kay Voges with Dirk Baumann and Alexander Kerlin, director of photography: Voxi Bärenklau, stage: Michael Sieberock-Serafimowitsch, live camera: Jonas Schmieta, composition/live music: T.D. Finck von Finckenstein, video art/live editing: Mario Simon, live texting: Alexander Kerlin, live sound: Joscha Richard, dramaturgy: Dirk Baumann and Alexander Kerlin at Schauspiel Dortmund in 2017. Trailer, credits and explanations: https://www.youtube.com/watch?v=FqBmvhjIzss [last access: 19.12.2020].

18 *Memories of Borderline*, authors: Kay Voges, Dirk Baumann and Alexander Kerlin, director: Kay Voges, Schauspiel Dortmund – engineering, 360° camera: Björn Lengers, Marcel Karnapke (CyberRäuber), video art, motion capture: Mario Simon, director of photography, lighting design: Voxi Bärenklau, stage design: Michael Sieberock-Serafimowitsch, costume design: Mona Ulrich, composition, music: Tommy Finke, coding: Lucas Pleß. Cf. https://ars.electronica.art/ai/de/memories-of-borderline/ [last access: 19.12.2019], Trailer: http://wp11159761.server-he.de/vtheater/de/memories-of-borderline/ [last access: 19.12.2020].

19 *Fragments – a digital Freischütz* is a co-production of Badisches Staatstheater Karlsruhe, Landestheater Linz and ZKM Zentrum für Kunst und Medien in Karlsruhe, funded by Kulturstiftung des Bundes (German federal cultural foundation), world premiere: April 26, 2019 in Karlsruhe; presentation at the Ars Electronica Festival 2019. Composer Micha Kaplan provided additional scores influenced by the original material. Concept, direction, realization: CyberRäuber (Marcel Karnapke, Björn Lengers), composition, sound design: Micha Kaplan, dramaturgy: Deborah Maier, production: Eva-Karen Tittmann. Max: Matthias Wohlbrecht; Kaspar: Ks. Konstantin Gorny; Ännchen: Agnieszka Tomaszewska; Brautjungfer: Camelia Tarlea. Musical direction (recordings): Johannes Willig, chorus direction (recordings): Ulrich Wagner; Badische Staatskapelle, Badischer Staatsopernchor. Trailer and information: http://wp11159761.server-he.de/vtheater/de/fragmente-ein-digitaler-freischuetz/ [last access: 19.12.2020]. Trailer: https://www.youtube.com/watch?v=qjNJVVtIFEs [last access: 19.12.2020].

20 The following analysis is based on explanations in an email of Björn Lengers, October 7, 2019, and the personal experience of Susanne Vill.

21 *Silicium 04* by Carl Emil Carlsen together with Bjørn Svin (music and dance), co-producer: The Culture Yard Click Festival at The Culture Yard (19–20 May 2018), Ars Electronica at Lentos Art Museum (6–8 Sep 2018), Funding: Danish Arts Foundation. Information and videoclips: http://www.cec.dk/works/silicium-04/ [last access: 19.12.2020].

22 Bjørn Svin's website: www.bjornsvin.com [last access: 19.12.2020].

23 Playwright: Very Mainstream Studio & Very Theatre, actors: Kasper Daugaard Poulsen and Wei Chun-Chan, production by Very Mainstream Studio & Very Theatre in collaboration with CLICK Festival and The Culture Yard, Elsinore in 2018, world premiere in Taipei, presentation at the Ars Electronica Festival in Linz 2018.

24 Information and videoclip: https://www.cphstage.dk/en/performance/chronicle-of-light-year/ [last access: 19.12.2019] and https://ars.electronica.art/error/de/4dbox-chronicleoflightyear/ [last access: 19.12.2019]; video: https://www.youtube.com/watch?v=HfFBQabFFb0 [last access: 19.12.2020].

25 "Creating augmented reality apps with web technology - Michaela Lehr", blog entry by Sebastian Gierlinger on scriptconf.org, https://scriptconf.org/blog/creating-augmented-reality-apps-with-web-technology-michaela-lehr/ [last access: 19.12.2020]. Already in 2007, Ray Kurzweil, inventor, futurist and Google director of engineering, had predicted that 2017 will be a "year of augmented reality" for which he foresaw an "explosive use of 360-degree Virtual Reality (VR)", cf. https://www.noorahannula.com/noora-vs-soma [last access: 19.12.2010].

26 *Noora Hannula vs. Soma, The Augmented-Reality Girl: The Ultimate Battle.* A dance performance by Noora Hannula, The Nordic Beasts, The Culture Yard and Bora Bora. Concept, choreography and live-performance: Noora Hannula, story consultancy and 3D animation direction: Petter Madegård, 3D technical director and animator: Belinda Larsen, music and sound design: Ida Duelund, motion captured dancer: Helena Wilhelmsson, VFX & animation: Ida Hove-Kreutzfeldt, 2D motion graphics: Søren Meisner. Text and video: https://www.noorahannula.com/noora-vs-soma [last access: 19.12.2010].

27 Cf. https://vimeo.com/276194625 [last access: 19.12.2020].