

THE FUTURE OF AUDIO-VISUAL DESIGNERS WITH A FOCUS ON SOUND

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Abstract

Sound designers have historically been associated primarily with the realm of films, TV-movies, and series production. However, the scope of their influence is expanding significantly beyond these domains. Notably, professionals in the fields of museum curation, festivals, theatres, and planetariums are increasingly recognizing the transformative potential of incorporating audio-visual elements into their presentations, thereby enhancing the overall quality of audience engagement.

Traditionally, many museums have relied on subpar audio guides and monotonous recordings played through inadequate loudspeakers to accompany their exhibits. In stark contrast, innovative exhibition concepts are foregrounding the profound impact of audio-visual installations. These installations completely rethink exhibition experiences, offering visitors entirely new dimensions of engagement within the realms of art, history, and science.

In the context of planetariums, a substantial majority of shows continue to feature cosmological themes and scientific narratives presented in full-dome environments. Nevertheless, universities and younger audio-visual designers are now pioneering groundbreaking advancements in immersive audio-visual experiences.

The evolution of theatre is yet another arena undergoing a profound metamorphosis due to the integration of audio-visual elements. As multimedia theatre forms such as picture theatre, new music theatre, and dance theatre increasingly embrace interactive electronic media, the traditional theatrical experience is undergoing a paradigm shift. This departure from convention is ushering in a new era of audio-visual performance quality that transcends prior artistic boundaries.

Given these transformative trends, the study of sound design is compelled to evolve in tandem. Incorporating visual tasks into the curriculum is becoming imperative, as sound designers navigate these innovative frontiers of multimedia integration. By embracing cross-disciplinary approaches that encompass both sonic and visual dimensions, aspiring sound designers will be better equipped to shape the future of immersive audio-visual storytelling across a diverse array of creative platforms.

Keywords: Sound Design, sound, immersive sound, sound design careers.

The following text explores the possibilities of sound design beyond the arena of cinema to examine current and new areas where sound plays a fundamental role. Referencing important terms combined with cinematic and auditory examples, I will explore the expanding frontiers of sound design and the role of the sound designer.

Technological innovation has paved the way for new realms where sound designers weave elaborate auditory experiences, immersing audiences in diverse sensory landscapes. This transformative phenomenon goes beyond the boundaries of the film industry, permeating various fields or immersive experience, such as radio drama, podcast creation, architectural design, scenography, theatre soundscapes, and planetarium shows.

Additionally, I will examine the importance of sound in the growing world of electric vehicles. As these new machines dominate our urban topography, the sounds they emit become extremely important for safety and overall user experience. Sound designers carefully design the distinct audio signature of these vehicles.

Extending into the domain of urban planning, the importance of soundscapes in creating harmonious living environments highlights again the expanding frontiers of sound design. Urban planners now leverage soundscape design to curate harmonious living spaces, while the burgeoning realm of artificial intelligence taps into the power of sound for optimizing human-machine interactions. Reflecting upon the deliberations at the *Cilect Asia Pacific Sound and Screen Conference 2022* held in Singapore, one discerns a salient truth: sound design's harmonization with the cinematic extends seamlessly across an array of disciplines, reshaping our interactions with technology, architecture, transportation, and the broader sonic universe we inhabit.

Film-Sound Design

Film sound design serves as a meticulously orchestrated arrangement of auditory elements within cinematic productions, functioning as a conduit to convey narrative, semantic, emotional, and perceptual experiences to the audience. In this intricate endeavor, the harmonious integration of dialogue, ambience, sound effects, and music culminates in the creation of a seamlessly unified auditory milieu. At its core, sound design is informed by a scientific foundation, drawing upon principles derived from the realms of psychoacoustics, cognitive psychology, and acoustics. This interdisciplinary amalgamation harnesses the intricate intricacies of human auditory perception to manipulate the spatial and temporal dimensions of sound, thereby augmenting both (sur-)realism and emotional resonance. Evidenced within are techniques spanning sound localization, frequency modulation, and reverberation, all of which coalesce to engross viewers within the cinematic diegesis. Through an artful synchronization, judicious balance, and intricate layering of auditory components, film sound design deftly steers and modulates viewers' emotions, attentional faculties, and cognitive engagement, therein significantly enriching the overall cinematic encounter while concurrently bolstering narrative storytelling as well as meta-storytelling endeavours.

Regrettably, the creative milieu of sound design often relegates sound designers to the role of technical operators, overshadowing their integral conceptual contributions. This disparity underscores the imperative of acknowledging the inherently multidisciplinary nature of sound design. Recent times have borne witness to a burgeoning industry-wide cognizance regarding the imperative to bridge the chasm that divides technical adeptness and artistic ingenuity within the domain of sound design.

Underpinning this paradigm shift is the discernible evolution in the process of crafting film soundscapes, observable through the lens of contemporary making-of documentaries. In such expositions, a burgeoning panorama of design practices emerges, surpassing the conventional confines of technical optimization for cinema audio mixing. In the contemporary landscape, sound designers play an active, pivotal role in shaping the emotional, narrative, and semantic resonance of a cinematic piece through their pioneering manipulations of sound. A symbiotic collaboration ensues as sound designers work in tandem with directors, cinematographers, composers, and fellow creatives, their collective endeavors culminating in the creation of immersive auditory tapestries that not only bolster but irrevocably transform the narrative trajectory.

In the ever-evolving digital milieu, technology stands as an enabler, endowing sound designers with uncharted horizons for exploration. Leveraging advanced sound manipulation tools, spatial audio methodologies, and immersive virtual reality platforms, sound designers now traverse the expansive realm of three-dimensional auditory environments. This trajectory extends far beyond the purview of technical implementation, ushering in an era wherein sound designers ascend to pivotal roles in the conceptualization and realization of intricate auditory narratives, profoundly shaping and augmenting the overall cinematic experience.

In tandem with this transformation, the academic sphere has responded with the inception of comprehensive study programs and workshops, congruent with the shift in emphasis from the purely technical to the resoundingly artistic and narrative dimensions of sound design. This proactive cultivation aims to foster a new generation of sound designers, adept not

only in technical prowess but equally fluent in the nuanced aesthetics of sound, imbued with an understanding of music theory and of cinematic language.

If you look at the films that were nominated or have won prominent awards at the Oscars or the German equivalent “Lola” in recent years, you can hear evidence of this advanced form of understanding sound design as an overall soundtrack design: *Joker* (2020)¹, *Sound of metal* (2021)² or *Im Westen nichts Neues* (2023).³

In summation, as the demarcation between technical and creative realms within sound design gradually fades, an unmistakable paradigm shift transpires, catalyzing the acknowledgment of sound designers as indispensable artistic collaborators. The modern cinematic ecosystem extols the collaborative ethos, duly recognizing that sound designers wield a unique perspective that augments cinematic landscapes with their imaginative, emotive, and semantically resonant auditory contributions.

Radio play

A radio play, denoted scientifically as an “aural narrative composition,” stands as a remarkable exemplar of auditory storytelling, deftly bypassing visual stimuli to channel narrative through sound alone. Rooted in the tenets of auditory perception and cognitive processing, this form of storytelling intricately engages the cognitive faculties of listeners to conjure mental imagery of characters, locales, and sequences. In the best cases by orchestrating a symphony of sound effects, dialogues, musical motifs, and vocal modulations, radio plays ingeniously harness psychoacoustic cues, thereby eliciting a panorama of emotions, spatial orientations,

1 *Joker* Soundtrack: Tom Ozanich, Dean A. Zupancic und Tod A. Maitland with the truly amazing film music by Hildur Guðnadóttir

2 *Sound of metal* Sound Design: Nicolas Becker, Jaime Baksht, Michelle Couttolenc, Carlos Cortés, Phillip Bladh

3 *Im Westen nichts Neues* Soundtrack: Lars Ginzler, Frank Kruse, Viktor Prášil, Markus Stemler, Stefan Korte with the awarded music from Volker Bertelmann

and temporal progressions. This art form adeptly exploits the intricate machinery of the brain's auditory processing, activating an intricate interplay between sensory and cognitive domains. Thus, radio plays emerge as a fascinating medium for probing the nexus between auditory perception and narrative cognition, affording invaluable insights into both realms.

The emergence of this inventive narrative mode unfurled on a global scale in tandem with the rapid advancement of radio technology during the 1920s. Amidst this technological revolution, radio transmitters and receivers proliferated, facilitating the rise of radio plays. This medium metamorphosed up to today into a dynamic playground for an eclectic cohort of creative luminaries, encompassing authors, playwrights, theater connoisseurs, sound artists, and musicians. Nonetheless, historical narratives elucidate a notable discrepancy, as sound designers, despite their pivotal roles, frequently languished in the shadow of their creative counterparts, rather than assuming direct authorial roles.

In the nascent stages of radio drama, visionaries such as Friedrich Bischoff, Walter Ruttmann, and the illustrious Orson Welles in the United States, steered this auditory craft onto an artistic trajectory. These pioneers, amalgamating literary sagacity with innovative sound manipulation - and in the case of Walter Ruttmann 1930⁴ already nearly completely non-verbal-, engineered immersive auditory tapestries that seized the imagination of avid listeners.

Nonetheless, as the medium matured, it metamorphosed into a sanctuary where sonic virtuosos found solace in auxiliary roles. Sound technicians, suppliers, mixers, and advisors gravitated towards shaping the technical aspects of radio plays, ensconcing within them soundscapes suffused with sound

effects, musical harmonies, and dialogic crescendos. This specialized acumen proved pivotal in endowing radio productions with an ambiance that resonated emotionally and atmospherically.

Yet, contemporary times have witnessed a gradual paradigm shift, effacing the historical chasm between creative and technical cadres. Within this shifting landscape, modern-day authors of radio plays are progressively recognizing the transformative influence of sound designers. In a significant departure, sound designers are now increasingly assuming central authorial roles, collaborating intimately with writers and directors. This creative alliance fosters the incubation of holistic sonic narratives, wherein soundscapes coalesce seamlessly with the written word to transmute storytelling into an immersive auditory odyssey.

In the present milieu, the horizons of radio plays encompass a kaleidoscope of genres and themes. Spanning fictional sagas and historical reenactments to cerebral documentaries and avant-garde auditory landscapes, this evolution invites sound designers to infuse their artistic sensibilities. This symphonic interplay between creativity and technology presents novel avenues to transcend conventional narrative thresholds.⁵

Anticipating the trajectory ahead, the demarcation between creative and technical roles within the realm of radio plays is poised to further blur, galvanized by relentless technological advancement. The advent of immersive sonic technologies—ranging from binaural soundscapes to three-dimensional audio panoramas—propels sound designers to ascend as protagonists in sculpting the destiny of radio features. By adroitly fusing technical acumen with imaginative narratives, sound designers beckon a forthcoming era that proffers richer, more immersive auditory experiences to a global audience.

4 Walter Ruttmann "Weekend" (1930): <https://museum.rechtaufremix.org/exponate/walter-ruttmann-weekend/>

5 Listen to recent radio plays, for example by Andreas Ammer in collaboration with *FM Einheit (Einstürzende Neubauten)*, or from Lucas Derycke or Ulrich Bassenge

Podcast

A podcast, an iterative digital audio or video program propagated via the internet, functioning under a subscription-based model, represents a paradigm embodying the intersection of modern technology and multimedia dissemination. The manifestation of this medium entails the orchestration of media content, predominantly auditory, with a foundation rooted in the principles of streaming and syndication technologies. Hosted files, colloquially termed episodes, are conveniently accessible, poised for on-demand consumption through a spectrum of platforms. The term “podcast” itself, an amalgam of “iPod,” emblematic of *Apple’s* pioneering portable media player, and “broadcast,” underscores the pivotal role it plays in revolutionizing modern modes of information-sharing, communication and the further development of the music walkman.

Recent temporal confines have witnessed the meteoric ascent of podcasts, an evolution characterized by exponential growth and an adaptive dynamism catering to multifarious interests. While the genesis of podcasts emanated from an auditory lineage, its trajectory has undergone a transmutation into an expansive multimedia platform, seamlessly fusing auditory and visual constituents. This metamorphosis unfurls avant-garde prospects, enabling creators to immerse their audiences within novel dimensions of engagement, marked by innovation and originality.

Beyond the palpable presence of popular figures, advertisers, and musicians, the podcasting sphere is undergoing a diversification, with a panoply of individuals contributing to its proliferation. Esteemed experts spanning diverse fields, encompassing scientific luminaries, historians, literary authorities, and virtuosos, are harnessing the potency of podcasts as an instrument for disseminating specialized insights and

sagacious knowledge. This paradigm shift has culminated in a rich array of podcast genres, spanning from riveting true crime narratives and compelling storytelling to instructive pedagogy and immersive auditory spectacles.

Fascinatingly, a discernible trend is discerned, one characterized by the augmentation of podcasts through meticulously curated auditory embellishments, including sonorous symphonies, ambient resonance, intricate acoustic backdrops, and immersive auditory phenomena. This innovative trajectory substantiates not only an elevated echelon of production caliber but also proffers listeners an evocative, multisensory odyssey that accentuates the narrative or informative essence.⁶

Furthermore, an upswing is evident in the realm of podcasts exploring the intricacies of language as an art form, embodying a compositional perspective that transcends casual discourse. Linguists, versifiers, and aficionados of language embark upon journeys dissecting the architectural scaffolding of communication, delving into linguistic nuances, and even embarking upon experimental linguistic flights within the podcast domain. This erudite orientation adds a stratum of intellectual profundity to the podcast milieu, catering to connoisseurs inclined towards a more scholarly engagement with the variegated facets of language.⁷

As the podcasting sphere continues its evolutionary trajectory, a synthesis of entertainment, erudition, and artistic expressiveness crystallizes, pushing the boundaries of conventional media dissemination. The inaugural epoch of “babble podcasts” gradually makes way for a new era characterized by thoughtfully curated content, innovative sonic tapestries, and intellectual gravitas, enriching the auditory and visual sojourns of the discerning listener.

6 For example, listen to the excellent podcast series by “Studio Bummens” (<https://studio-bummens.de>)

7 Audio samples for this: Radio play precursor by Mauricio Kagel ‘...upon reading Orwell : Radio play in Germanic meta-language’. Or currently a hybrid production between radio play and podcast by Lukas Derycke ‘Esperanto’.

Theatre & Contemporary Dance

Scientifically known as dramaturgy, is a multifaceted form of performing arts that merges psychology, sociology, and aesthetics. It involves the collaborative creation and enactment of narratives through scripted dialogue, physical actions, and visual elements within a designated and designed space. The discipline encompasses principles of cognitive psychology, exploring how audiences perceive and interpret emotions, thoughts, and intentions of characters. Sociologically, theatre reflects cultural norms and societal dynamics, offering insights into human interactions and social constructs. The study of theatre also encompasses visual aesthetics, incorporating design elements such as set, costume, lighting and sound design to evoke emotions and enhance storytelling. Scientifically analyzing theatre involves investigating its impact on cognition, emotions, and social dynamics, shedding light on the intricate interplay between creativity, psychology, and society.

The world of Theatre and contemporary dance has evolved into a dynamic and expansive creative realm in recent years. This evolution is particularly evident when considering its intermedial nature, where collaborations between dancers, actors, and sound creatives result in innovative audio-visual experiences. In these collaborative endeavors, the role of the sound creative becomes a fascinating and multi-faceted one. This can encompass various roles, such as composer, electro-musician, or sound designer, blurring the traditional boundaries between these disciplines. The question of the sound creative's precise role within this audio-visual synergy is both intriguing and complex. Rather than pigeonholing them into a specific category, the focus should shift towards understanding the depth of their involvement and the breadth of their

knowledge. To truly thrive in this collaborative landscape, a sound creative should possess a holistic understanding of various elements within the performing arts. First and foremost, a grasp of the intricacies of theatre and/or dance is essential. This includes an appreciation for different dance styles, movement techniques, and choreographic narratives. Moreover, an understanding of the actors' voices and singing can elevate the auditory dimension of the performance, ensuring that the sound complements and enhances the emotions and subtexts conveyed through speech and song. Furthermore, a comprehensive knowledge of stagecraft is indispensable. This entails familiarity with stage layouts, set design, and the overall spatial dynamics of a performance. A sound creative who comprehends how sound interacts with the physical stage and its various elements can craft an audio experience that resonates harmoniously with the visual aspects.⁸ In the realm of contemporary technology, proficiency in working with lighting systems, cameras, and interactive patches becomes increasingly important. These technological components contribute to the immersive nature of modern performances, where sound seamlessly intertwines with visual elements. A sound creative who can manipulate these tools effectively can contribute to the creation of captivating and unforgettable moments on stage. Ultimately, the role of the sound creative in theatre and/or contemporary dance transcends rigid labels. It is a role that demands versatility, adaptability, and an insatiable curiosity for learning across disciplines.⁹

As the performing arts continue to evolve, those who partake in these collaborative ventures will find that the boundaries between composer, electro-musician, and sound designer become less distinct, giving rise to a new breed of creative professionals who are masters of multiple domains and of artistic innovation.

8 Listen to the music and amazing sound design by Jean-Jacques Lemetre for the play (2 DVD's) *Le Dernier Caravanseraïl (Odyssees)* by the *Theatre du Soleil* in Paris as an example.

9 The Düsseldorf *Theater der Klänge*, which I direct, has been working since 2005 on intermedia forms of contemporary dance, electronic music modulated by dancers, and sound design concepts for complete productions (*HOEReographien* - 2005, *SUITE intermediale* - 2010, or even most recently "Das Lackballett" - 2019.); www.theaterderklaenge.de



Fig. 1 Interactive Dance and electronic sound in „SUITE intermediale“ - THEATER DER KLÄNGE 2010 (Photo: Rosa Rühling)

Audio-Vision:

Audio-vision, an intricate interdisciplinary field, delves into the amalgamation of auditory and visual perception within the human cognitive framework. Scientifically underpinned,

this realm probes the neural mechanisms underpinning the fusion of these sensory inputs, revealing insights into the intricate processes of multisensory integration and synesthetic experiences. This holistic exploration contributes to diverse domains such as psychology, neuroscience, and technology,

notably advancing virtual reality, cognitive science, and sensory substitution paradigms.

At the intersection of this cognitive juncture lies sound art, a multifaceted domain where auditory and visual dimensions meld to create immersive, thought-provoking experiences. The expanse of sound art, mostly synonymous with audio-visual art, has found resolute footing within esteemed museum and gallery contexts, effectively ensnaring audiences with its captivating and cerebral presentations. Furthermore, this expressive form has seamlessly integrated into museums and exhibitions, thus enhancing the tapestry of applied arts.¹⁰

Of particular intrigue within sound art is the emergence of a remarkable trend – the convergence of diverse creative backgrounds. Visual artists, harnessing their expertise in visual aesthetics, pivot toward the auditory domain, ushering in novel realms of creative expression. This sensory amalgamation enriches audience encounters, effectively erasing conventional artistic delineations and propelling artistic boundaries to new frontiers.

Transcending this artistic intersection, even renowned pop musicians have embarked on forays into sound art. By redirecting their musical prowess toward experimental and artistic ventures, they infuse sound art with a *mélange* of influences and narratives. This confluence of pop-culture and avant-garde exploration results in an enthralling fusion of entertainment and artistic integrity, showcasing the versatility of these musicians and the boundless potentials of sound art.¹¹

Central to this field's evolution is the cornerstone of collaboration. Curators often commission projects that challenge the orthodoxy of auditory and visual experiences. Herein, sound designers assume pivotal roles as instrumental executors,

translating abstract conceptualizations into tangible auditory realities. Their confluence of technical proficiency and artistic sensibilities shapes the ultimate outcome, seamlessly embedding sound within the broader artistic tapestry.

Continuing to evolve, sound art resonates globally, inviting audiences to partake in the intricate interplay between auditory and visual realms. This multidisciplinary approach reshapes the landscape of artistic communication, providing a unique platform for artists, musicians, and curators to push the frontiers of creativity and ideation. Whether ensconced in the hush of a museum hall or within the dynamic ambience of an exhibition space, sound art persists as a testament to the limitless scope of creativity and collaborative potential.

Full-Dome

The term "full-dome" conveys a concept of paramount significance in contemporary visual immersion technology, especially in the context of planetariums and immersive displays. This technological paradigm entails the deployment of a hemispherical projection surface that judiciously envelops the entire visual expanse of the observer, fostering a holistic and uninterrupted experiential continuum. Through the utilization of projectors in sophisticated digital systems, an array of meticulously crafted images and videos are elegantly showcased upon the curvature of this surface. The overarching objective is to simulate a diverse array of celestial bodies, astrophysical phenomena, or even artistic creations. This intersection of technology, optics, and geometry conveys intricate three-dimensional renderings, thereby enhancing both pedagogical and recreational dimensions.

Indeed, the contemporary iteration of planetariums stands as a testament to the remarkable advancements in audio-visual

¹⁰ <https://zkm.de/de/ausstellung/2012/03/sound-art>

¹¹ "Monkey Drummer" (2001) from Chris Cunningham or "aoyama space no. 4" (2009) from Carsten Nicolai (Alva Noto). Or more prominent Björk: "Experiments and Explorations" (2015) or "Sound Gallery: IN A GARDEN" by Brian Eno (2022)



Fig. 2 Interactive Dance in a full-dome-show with spatial sound in "Man and Art Figure in a Sphere theatre" - THEATER DER KLÄNGE 2021 (Photo: Oliver Eltinger)

innovation. The transformation from rudimentary origins in the 1920s to these state-of-the-art locales is emblematic of the strides made in harnessing technology for immersive engagement. At the heart of these advanced spaces are the awe-inducing 180-degree video full-dome projections. These visual marvels are enabled by cutting-edge digital projection systems that not only impart a heightened level of visual fidelity but also facilitate the effective visualization of intricate cosmic details.

Integral to the immersive experience is the evolution of spatial audio technology. In certain advanced planetariums, the convergence of intricate acoustic engineering and architectural design has engendered elaborate spatial sound systems. These systems, often boasting an ensemble of up to 64 speakers, are deftly orchestrated to create a three-dimensional auditory landscape. Through this sophisticated auditory architecture, visitors are enveloped in a sonic tapestry that

harmoniously resonates with the visual panorama, thus magnifying the experiential depth.¹²

Reflecting on the historical continuum of planetarium evolution unveils visionary ambitions that have matured into a global phenomenon. Karl-Heinz Stockhausen's pioneering aspirations in 1970 within the *German pavilion* at the *Osaka World Expo* marked a seminal moment in pushing the boundaries of artistic expression within the full-dome context. This metamorphosis has propelled planetariums to their contemporary status as versatile and multifaceted venues, transcending traditional star displays to encompass a diversity of engaging events.

The integration of experimental music and visual art stands as one of the most enthralling applications of planetarium technology. The synchronization of intricate light shows or full-dome videos with musical compositions leads to a synesthetic symphony wherein sound and sight coalesce into an immersive gestalt. This blurring of sensory boundaries imparts an orbit-like sensation to the auditory experience, thereby captivating audiences on an unprecedented level.

Furthermore, planetariums have proven to be pedagogical and scientific crucibles. Beyond conventional star-centered lectures, they have evolved into platforms for astronomy instruction, virtual space exploration, and intricate data visualization. These spaces are emblematic of the convergence of art and science, birthing multimedia collaborations that transcend traditional disciplinary silos.

In summation, today's planetariums epitomize the fusion of ingenuity and technological prowess. They have evolved into immersive spaces that seamlessly blend visual, auditory, and

intellectual engagement. As technological horizons continue to expand, the potential for future planetarium experiences appears boundless, promising voyages through the cosmos and the corridors of artistic imagination that are poised to be ever more awe-inspiring.

Auditory scenography

Auditory scenography is a multidisciplinary approach that blends auditory elements with spatial design to create immersive environments. Rooted in cognitive psychology and acoustics, it manipulates sound's spatial perception to enhance emotional engagement and spatial awareness. By leveraging psychoacoustics and spatial audio technologies, auditory scenography orchestrates a sensory experience where sound interacts with physical space, impacting human perception, storytelling and emotions, making it a powerful tool in fields like architecture, virtual reality, and performing arts.

In recent years, the synergy between architecture, scenography, and sound design has become an integral part of creating immersive and captivating experiences at world expositions, large museums, and trade fair events. These multidisciplinary collaborations have led to the emergence of a fascinating field where the boundaries of traditional design are pushed, and innovative auditory scenographies are brought to life.

One notable example of this trend could probably be seen and heard in the *Expo 2025* held again in Osaka, Japan, where the entire exposition site is planned to be transformed into a mesmerizing auditory landscape. Collaborating architects, scenographers, and sound designers will work for that meticulously to craft an environment where visitors not only visually immersed themselves in cutting-edge exhibits but will

12 For example, visit the planetariums in Bochum (D) or Jena (D), both of which have installed a full-dome projection system (*powerdome@VEL-VET*) together with a spatial audio installation (*Atmosphea System* - Fraunhofer Institute for Digital Media Technology IDMT) in domes of different sizes. The *Atmosphea* system can also be controlled with the "Spatial Audio Designer" (SAD) by the Hamburg company NEW AUDIO TECHNOLOGY.

be also enveloped in a symphony of carefully curated sounds that will complement each thematic zone.¹³ This approach will add a new dimension to the traditional concept of world expositions, allowing attendees to engage with the content on a deeply sensory level.

Actually the *Louvre Abu Dhabi*¹⁴ or the *National Museum of Qatar*¹⁵ are examples of a prime big illustration of the integration of auditory scenographies within the context of large museums. Renowned for their unique architecture, these museums also place a strong emphasis on sound design as an integral part of the visitor experience. Here, soundscapes seamlessly intertwine with the exhibits, guiding visitors through a sonic journey that enhances their understanding and emotional connection to the art and artifacts on display.

Spectacular trade fair events have equally embraced this innovative approach. The *Milan Design Week*¹⁶ has evolved beyond a mere showcase of products and concepts into an immersive auditory and visual extravaganza. Leading sound design firms collaborate alongside architects and scenographers to create for example also for *Volkswagen* experiential installations that transport visitors into alternate realities, where spaces come alive through thoughtfully orchestrated soundscapes.¹⁷

Despite these remarkable strides, there is a recognition within the exhibition scene that more ambitious projects are needed to fully explore the potential of this collaborative field. As technology advances, such as the utilization of spatial audio and recording techniques, there is an increasing demand for high-quality sound service providers who can transcend the

role of technical implementers. This requires sound designers who possess not only technical prowess but also a deep understanding of narrative, semantics, emotion, and human perception, enabling them to craft auditory experiences that resonate profoundly with audiences.

In conclusion, the integration of sound design into the conceptualization of architectural and scenographic spaces marks an exciting evolution in the realms of world expositions, large museums, and trade fair events. The harmonious fusion of architecture, scenography, and sound design creates immersive environments that engage visitors on a holistic level, stimulating their senses and associative perceptual possibilities. While there is still untapped potential to explore, the groundwork has been laid for a future where auditory scenography plays an increasingly vital role in shaping how we experience and interact with the built environment.

Electro-Mobility

Electric vehicles (EVs) stand as a remarkable manifestation of technological prowess, harnessing the principles of electromagnetism to revolutionize transportation. These innovative conveyances are propelled by electric motors, which orchestrate the conversion of electrical energy, garnered from potent lithium-ion batteries, into mechanical impetus. The intricate interplay between electric currents and magnetic fields precipitates the generation of motion, exemplifying the fusion of scientific principles and practical application.

Undoubtedly, the advent of EVs heralds a paradigm shift in the automotive landscape, offering a potent antidote to the

13 See the concepts for the projects "Totality of life", 'Invigorating Lives', 'Forging Lives' or 'Invigorating Lives': www.expo2025.or.jp/wp/wp-content/themes/expo2025orjp_2022/assets/pdf/masterplan/expo2025_masterplan_en.pdf

14 <https://www.projectiles.net/en/museographie-du-louvre-abu-dhabi/>

15 <https://ideeundklang.com/audio/en/work/exhibitions/NMOQ2019.html>

16 <https://www.stirworld.com/see-features-fashioned-to-transcend-design-fashion-and-scenography-at-milan-design-week-2023>

17 Autowerk - Portal to Production – 2014: <https://ideeundklang.com/audio/en/work/exhibitions/autowerk.html>

ecological perils precipitated by traditional internal combustion engine vehicles. Aiding in the mitigation of greenhouse gas emissions and curtailing the dependency on finite fossil fuels, EVs stand as harbingers of sustainable mobility. The EU's proactive measure, a regulation implemented in July 2022, underscores the commitment to amalgamate cutting-edge innovation with safety and environmental consciousness.

The *Acoustic Vehicle Alert System* (AVAS), the regulatory clarification, underscores the indispensability of incorporating auditory dimensions into the electric vehicle experience. This auditory elucidation addresses the imperative of ensuring the safety of pedestrians and cyclists, particularly those with visual impairments, who might be imperiled by the otherwise unobtrusive demeanor of EVs. Striking a delicate equilibrium between functional auditory alerts and the preservation of urban soundscape tranquility is the crux of this directive.

Since managers of large car companies believe that the sound design for blockbuster films would also be realised by film composers, they asked renowned musicians for the first brand sound designs for their first e-mobile fleets. BMW, recognizing the significance of auditory identity in their electric lineup, enlisted for example the expertise of the film-music-composer Hans Zimmer to craft the soundscapes for their electric cars. Zimmer's studio crew has translated Zimmer's musical prowess into designing sounds that not only enhance safety but also contribute to the overall driving experience.¹⁸ Similarly, *Volkswagen* (VW) took a similar, but more unfortunate approach by collaborating with a former drummer from the German pop group "Genghis Khan". This decision is demonstrating the diverse range of creative talent involved in the evolution of EV sound design. This drummer was tasked with infusing VW's electric vehicles with distinct and recognizable sounds that align with the brand's ethos...

This confluence of auditory artistry and vehicular innovation extrapolates its roots into the world of science fiction cinema. In this realm, sound designers have long been the custodians of the auditory essence of fictional vehicles, a creative endeavor now finding resonance in the real world. EVs, much like the iconic vehicles from cinematic classics like the *Spinners* from *Blade Runner*, the *Millennium Falcon* or the *Batmobile*, stand poised to bear distinct and emblematic auditory signatures, further cementing their identity.

In summation, the EU's mandate regarding perceptible EV sounds has catalyzed a harmonious convergence of technological innovation, auditory artistry, and regulatory foresight. This evolutionary juncture signifies not a culmination but rather an incipient chapter in the saga of electric vehicle soundscapes. As the collaboration of technology and creativity embarks on a transformative journey, the urban mobility of tomorrow resonates with the cadence of a hopefully "harmonious urban future".

Editor

A film editor's role encompasses a dynamic synthesis of intricate visual and auditory components within the realm of filmmaking. This intricate craft involves not only the assembly but also the deft manipulation of visual and auditory elements, entailing a profound grasp of perceptual dynamics, cognitive psychology, semantic nuances, and emotional responses. This amalgamation serves as the bedrock for constructing a coherent narrative structure that captivates and engrosses viewers. Employing an arsenal of techniques grounded in principles of human cognition, film editors orchestrate the arrangement of shots, scenes, and sequences with meticulous precision, thereby crafting a compelling cinematic tapestry that resonates with audiences on multifaceted levels.

18 Hans Zimmer and Renzo Vitale for BMW: <https://www.bmw.com/de/magazine/innovation/Hans-Zimmer-individuelle-Antriebs-sounds-als-Identitaet-fuer-neue-Elektromodelle.html>

The editors' prowess extends beyond mere technical proficiency; it's an art that permeates the very essence of the medium. Employing sophisticated software, they intricately choreograph the synchronization of diverse shots while modulating pacing and manipulating temporal and spatial relationships. This holistic endeavor, rooted in the realms of spatial cognition and emotional connectivity, essentially molds the viewer's perceptual experience. Editors wield the power to shape the audience's perception of time's flow, spatial dynamics, comprehension, and emotional states, thereby underscoring their pivotal role in crafting the overarching cinematic encounter.

One luminary, Walter Murch, stands as a testament to the transformative potential of sound and image symbiosis. Murch's visionary contribution burgeoned during an era dominated by physical film strips and tapes, yet his innovative philosophy seamlessly melded sound and image. Recognizing that cinema is a harmonious amalgam of sensory stimuli, Murch orchestrated the fusion of sound and visuals with unparalleled finesse. His distinct approach revolutionized film sound editing by advocating for a perspective that regarded the moving image track as a malleable element, akin to the sound stems under his purview. This breakthrough precipitated novel editing methodologies and profound advancements in audiovisual storytelling techniques, paving the way for future explorations of their synergistic interplay.¹⁹

The predilection for picture editing over sound editing stems from the inherent nature of human engagement with narratives. Visual cues invariably serve as the initial gateway for audiences to immerse themselves in the cinematic realm. The perceptual and cognitive biases woven into our cultural fabric further reinforce this visual-centric tendency, underscoring the significant role visuals play in shaping our preferences and storytelling inclinations.

In the practical landscape, navigating the simultaneous terrain of picture and sound editing—especially during on-set production—presents a multifaceted challenge. Capturing pristine, high-quality audio during filming necessitates specialized expertise. To ensure an impeccable auditory tapestry, the sound editing process is distinct from picture editing, allowing post-production sound editors to intricately finesse and harmonize sound elements in alignment with the ever-evolving visual narrative.

The innovative concept of synchronized picture and sound editing has gained traction in select filmmaking paradigms. Experimental and avant-garde productions embrace a harmonious, real-time melding of these domains, blurring the conventional lines between visual and auditory creativity from inception.²⁰

In summation, Walter Murch's pioneering vision of integrated film editing has bequeathed a legacy that celebrates the symbiotic dance between sound and image. The inclination towards prioritizing picture editing over sound editing is inherently linked to the predominance of visual storytelling and the cognitive predispositions of human perception. While the simultaneous pursuit of both disciplines is a concept replete with potential, its practical execution demands a nuanced equilibrium between expertise, resources, and creative intent. As such, it emerges as a potent tool within the filmmaker's arsenal, tailored to the unique demands of each creative endeavor.

Design & Architecture

Design scientifically involves systematically creating and refining solutions or experiments guided by empirical evidence and logical reasoning. It entails formulating hypotheses, defining variables, and structuring methodologies to gather

19 https://www.goodreads.com/book/show/2141.In_the_Blink_of_an_Eye

20 <https://www.degruyter.com/document/doi/10.7312/chio18588/html>

accurate and reproducible data. In the realm of design and architecture, the creative process goes beyond just what meets the eye. While visual design, interior design, and scenography play a crucial role in shaping the aesthetics and functionality of a space, the sensory experience extends further to encompass the auditory realm as well. Designers and architects are increasingly recognizing the significance of sound in shaping the overall atmosphere and ambiance of a place. Incorporating auditory elements into the design process has the potential to elevate spaces to new heights. Architects and interior designers are not limited to the role of merely mitigating acoustic issues after the fact; rather, they can actively contribute to crafting acoustic environments that harmonize with the visual aesthetics. This multidimensional approach involves collaboration between audio-visual teams, allowing for the seamless integration of sound and visual design.

Imagine a concert hall where the architectural design not only caters to the visual elegance but also considers the acoustic properties that optimize the music-listening experience. The positioning of materials, shapes, and surfaces can contribute to sound diffusion, absorption, and reflection, all of which contribute to the auditory quality of the space. Similarly, in cinema or theater design, the arrangement of seating, materials, and architectural elements can influence how sound travels, enhancing the audience's immersion and engagement. To achieve this synergy between visual and acoustic design, professionals from various disciplines come together, including architects, interior designers, acousticians, and sound designers. By fostering a collaborative environment from the outset, these experts can jointly create spaces that engage all the senses. Acoustic simulation tools and technology allow designers to predict and model how sound will interact within a given space, enabling them to make informed decisions that optimize both the visual and auditory aspects. Ultimately, the goal is to create holistic environments where form, function, and sound intertwine seamlessly. Designers and architects who conceive with their ears, in addition to their eyes, open up a realm of possibilities for innovation and creativity. This

approach ensures that the spaces we inhabit not only delight our visual senses but also envelop us in a captivating and immersive auditory experience.

Design, a quintessential process, is predicated upon a systematic approach characterized by the deliberate construction and iterative refinement of solutions or experimental paradigms underpinned by the bedrock of empirical evidence and cogent logical inferences. This cognitive enterprise encompasses the conceptualization of hypotheses, the elucidation of variables, and the strategic configuration of methodologies meticulously designed to elicit accurate and reproducible data, thus entailing an intricate interplay between creativity and methodological rigor.

Within the expansive domain of design and architecture, the contours of the creative process transcend superficial aesthetics, embracing a panoply of sensory dimensions. Beyond the realm of visual design, interior configuration, and scenographic assembly, the sensorial tapestry extends its tendrils into the auditory domain. Savants in the domains of architecture and design are increasingly awakening to the profound role sound occupies in the orchestration of the holistic ambiance and atmosphere within a given space.

The paradigmatic shift entails an evolution beyond the reactive approach of addressing acoustic exigencies in a post facto manner. Architects and interior designers are transmuting into active agents of soundscape curation, fusing aural aesthetics harmoniously with their visual counterparts. This multidimensional transformation burgeons through interdisciplinary confluence, where the choreography of sound converges seamlessly with visual design under the aegis of collaborative endeavors.

Logically this realization precipitates the convergence of multifarious disciplines, amalgamating architects, interior designers, acousticians, and sound designers in a collaboration. The inception of a shared vision engenders an ecology wherein

spatial configurations resonate with the auditory and visual senses in synchronous harmony. Augmented by cutting-edge acoustic simulation tools and technological modalities, designers are empowered to prognosticate and model the intricate cadence of sound within a given spatial canvas, wielding an informed agency over the optimization of both auditory and visual dimensions.

The pinnacle of this paradigmatic shift is encapsulated within the aspiration to sculpt holistic environments wherein form, function, and sound serendipitously interlace. Architects and designers, who embolden their conceptualization processes with an auricular dimension, beckon forth a realm of innovation and creative prowess. The resultant trajectory underscores the aspiration to nurture habitats that titillate not solely the ocular senses but also cocoon their occupants within an entrancing and immersive auditory narrative.²¹

Sound Studies

Sound Studies, a dynamic and interdisciplinary field, is dedicated to the comprehensive investigation of sound phenomena. This multifaceted domain encompasses a broad spectrum of inquiries ranging from the scientific analysis of sound's physical attributes to its profound impact on human cognition and societal dynamics. By drawing upon the confluence of acoustics, psychology, musicology, and cultural studies, Sound Studies orchestrates an intricate symphony of knowledge that resonates across diverse disciplines.

At its core, Sound Studies delves into the intricate tapestry of sound – its genesis, transmission, reception, and subsequent repercussions. The scientific exploration of sound waves elucidates their waveforms, frequencies, and propagation mechanisms, shedding light on their intrinsic properties.

This rigorous scientific foundation is seamlessly intertwined with psychological and physiological studies that uncover how sound interfaces with human perception and cognition. Furthermore, the cultural and social dimensions of sound are intricately woven into the fabric of Sound Studies, unraveling the intricate relationship between sonic experiences, cultural expressions, and societal norms.

A remarkable hallmark of Sound Studies is its role as a bridge that connects scientific rigor with cultural insights. By amalgamating empirical investigations with cultural interpretations, this field investigates how sound shapes human experiences and molds interactions within a technologically-driven society. This dynamic interplay is exemplified in the burgeoning intersection of sound, technology, and society, where the unity of technology and culture creates new forms of listening experiences.

The scope of sound creation, a central tenet of Sound Studies, extends beyond conventional boundaries. It navigates through a diverse landscape encompassing musicology, media studies, and beyond. While musicology remains a foundational focus, the field transcends these boundaries to explore the synergy of sound with visual elements. It's noteworthy that the expansive realms of sound, and particularly the intersection with visual media, were historically underrepresented in the academic discourse. However, the past 15 years have witnessed a transformative shift, as Sound Studies has emerged as a distinct academic discipline.²²

The study of soundscapes, a vital dimension of Sound Studies, delves into the intricate interplay between auditory environments and human emotions. As urbanization intensifies, the specter of sound pollution looms large, necessitating an in-depth examination of its ecological and societal

21 The acoustic design from Yasuhiso Toyota for the Hamburg *Elbphilharmonie*: <https://sz-magazin.sueddeutsche.de/musik/geoert-zum-guten-ton-82501> – also read: <https://www.elbphilharmonie.de/en/mediatheque/the-acoustics-at-the-elbphilharmonie/221>

22 UDK-Berlin: *Sound Studies and Sonic Arts*: <https://www.udk-berlin.de/en/courses/sound-studies-and-sonic-arts-master-of-arts/>

implications. Furthermore, the emergence of acoustic art as an avant-garde domain underscores the creative fusion of auditory and visual elements, opening new avenues for artistic exploration and expression.

As Sound Studies gains momentum, it has progressively ingrained itself within academic curricula, research endeavors, and scholarly discourse. No longer relegated to the periphery, Sound Studies stands as a complementary discipline to music and media studies, enriching our understanding of sensory perception, communication, and cultural dynamics. Its surging importance is reflected in its prominence in international conferences, serving as an interesting platform for scholars to exchange innovative ideas and groundbreaking advancements.

Seminars and workshops dedicated to Sound Studies serve as crucibles of intellectual exploration, fostering collaboration among scholars from diverse backgrounds. These gatherings nurture a holistic exploration of sound's multifaceted dimensions, catalyzing the synthesis of scientific rigor and artistic imagination.

In summation, the trajectory of Sound Studies showcases the evolution of academic inquiry in response to the complexities of our world. Its inclusive approach spans a spectrum of disciplines, propelling our understanding of sound's reverberations across the domains of science, culture, and art. As the resonance of Sound Studies grows stronger, its foundational role in cultivating an enriched appreciation for auditory experiences and cultural narratives becomes increasingly evident.²³

Creative Audio Director

The role of a *Creative Audio Director* involves the orchestration of auditory elements to evoke emotional and cognitive responses. Drawing from principles of psychoacoustics,

cognitive psychology, and audio engineering, they design sounds, spatial attributes, and temporal patterns to craft immersive and impactful auditory experiences. Leveraging advanced technologies, they optimize sound synthesis, processing, and mixing to align with human auditory perception. Through a systematic integration of artistic intuition and scientific rigor, Creative Audio Directors shape audio content to resonate with audiences, facilitating engagement, emotional connection, and narrative comprehension. This role bridges the realms of art and science, fostering a symbiotic relationship between sensory perception and cognitive processing for enhanced storytelling and multisensory engagement.

A sound director, also known as an audio- or sound-supervisor, plays a pivotal role in shaping auditory experiences across various professional domains. Within the realm of audio competence, this individual serves as the focal point for orchestrating auditory perceptions in a multitude of work environments, as highlighted in the scenarios previously mentioned. Their expertise extends beyond mere technical aspects, encompassing a profound understanding of sound aesthetics, sound crafts, psychological impact, and storytelling. The task of this head of department is not to carry out all the trades, but to engage and supervise the work of the various sound trades. Only someone who has already worked practically in all the trades and thought creatively can understand the work of the individual collaborators and put it together in such a way that it becomes a whole. At the same time, this head also acts as an interpreter and diplomat. He has to translate the sometimes very technical terms of musicians and sound designers for visually thinking and trained people. He also has to communicate the possibilities and needs for sound in audio-visual contexts in such a way that the overall planners understand this as an enrichment of their concepts. This, too, is only possible with a profound knowledge of the criteria for visual design, architecture, film-making or even vehicle design or exhibition design.

23 <https://www.transcript-verlag.de/978-3-89942-894-0/sound-studies-traditionen-methoden-desiderate/>

Drawing inspiration from the Creative Director archetype, commonly found in advertising and exhibition settings, the Creative Audio Director assumes the mantle of guiding audio direction within a project. Much like the Director of Photography's influence on visual storytelling in cinema, the Creative Audio Director shapes the auditory narrative, influencing emotions, tension, and engagement within film projects. Moreover, in parallel to the roles of a Creative Director or an Art Director, this professional establishes aural aesthetics in diverse contexts, such as video games, virtual reality experiences, interactive installations or sonic branding strategies.

As technology continues to advance, the Creative Audio Director's role becomes increasingly integral. They leverage cutting-edge tools and techniques to design sound that resonate with audiences, enhancing the overall impact of the creative work. By collaborating closely with directors, several trades of sound-designers, and other creative minds, the Creative Audio Director ensures a harmonious fusion of auditory and visual elements, leading to a truly immersive and memorable audience experience.

In essence, the title "Creative Audio Director" encapsulates the multifaceted responsibilities of an audio visionary and supervisor who not only harnesses the power of sound but also wields it to sculpt compelling narratives, evoke emotions, and elevate the quality of artistic and commercial endeavors across a diverse array of media.

It is important to note that while some decision-makers may lack a comprehensive understanding of the value and potential of study master-programmes for this field of sound work, there are – see the text above – instances of successful integration between artistic and technical realms. Collaborative efforts between institutions, industry and institutional

partners, and creative professionals have shown promising results in bridging this gap. Furthermore, the disinterest of the sound artists' guild in such Master's programmes is a multifaceted issue.²⁴

There are encouraging signs of change. Young sound creatives are increasingly seeking avenues to expand their horizons and pursue advanced education to hone their craft. Initiatives that emphasize interdisciplinary collaboration and the integration of sound studies with other artistic and technical disciplines are gaining momentum. As the creative landscape continues to evolve, there is an opportunity for universities, industry leaders, and artists' guilds to come together and shape a more comprehensive and supportive educational ecosystem for the next generation of sound creatives.²⁵

Conclusion

The allure of deep expertise in audio and sound design for ambitious multimedia endeavors is undeniable. It is within this framework that teams comprising highly skilled individuals contribute unique expertise to the broader creative process.

Within the contemporary milieu of multimedia production, the orchestrating principle of synergizing diverse talents within fluid workflows emerges as an indispensable hallmark. At the heart of this operational paradigm lies the constitution of a cohesive team, an amalgamation of adroit professionals, each endowed with a unique proficiency poised to enrich the evolving tapestry of creation. Sound design, conventionally perceived through the narrow prisms of sound engineering, operational dexterity, or mere technical service provision, is potentially confined to the limitations of these defined roles.

24 <https://fhdo-design.de/de/meldungen/rueckblick/rueckblick-auf-die-tonmeistertagung-2021>

25 Read in german language my article "Crative Audio Director vs. Sound-Operator : https://bvft.de/epaper-Filmtonguide_2023-Teil-1/index.html#6 (page 77)

Yet, a captivating metamorphosis unfurls as sound creatives, propelled by a nascent realization, transcend their conventional designations to unveil themselves as veritable audio masters, poised to assume the mantle of *Creative Audio Directors* on an egalitarian pedestal. This subtle yet seismic shift in perception decisively recalibrates the parameters governing collaboration dynamics, propelling the collective endeavor towards ascendant plateaus of ingenuity, and a heightened manifestation of audio-visual finesse. The clarion call for such a transformative paradigm reverberates insistently within the burgeoning expanse of the market's voracious appetite for novel narrative encounters.

Unfortunately, it is not uncommon for sound creatives to relegate themselves to the periphery, acquiescing to the unobtrusive roles of technicians. This self-imposed relegation, often rooted in an erroneous societal veneration of tangible functionality over abstract creativity, inadvertently imposes fetters on the inherent imaginative potential that lies within. By embracing the truest nuances of their identity as indefatigable creatives, and by resolutely asserting their unassailable authority as quintessential audio authorities, these visionary artisans not only elevate their personal standing within the creative hierarchy but also effectuate a discernible amplification in the cumulative quality of the audio-visual tapestry that unfurls before the audience's discerning gaze.

In closing, the inexorable march of progress imparts an unequivocal mandate upon the sons and daughters of sound innovation. It is a mandate to emancipate themselves from the confinements of perceived technical roles, to relinquish the shackles of unassuming technicians, and to boldly ascend the dais as really to be described as *Creative Audio Directors*. This metamorphosis is a clarion affirmation of the multifaceted potential that sound design embodies – a potential that transcends traditional limitations to sculpt narratives of sonic

and visual brilliance that resonate profoundly within the annals of contemporary multimedia expression.

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26 <https://scholar.google.at/citations?user=-nTdpGkAAAAJ&hl=de&oi=sra>

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In 2024, the publication of a comprehensive compendium in print and online is planned by Art Style | Art & Culture International Magazine: “Acoustic pathways - After the turn”.