Cinematic Aided Design as resourceful possibilities and solutions to creativity. In a not often consider for instance, sensory and cognitive modalities by mind but usually ignored during the design process; designers Screen, Architecture mapping is this moving image methodology? facades as performative urban screens. What kind of multimedia scale projector-based filmic displays that are ornamenting non-narrative filmic contents. Today many cities create large-scale projector-based filmic displays that are ornamenting facades as performative urban screens. What kind of multimedia mapping is this moving image methodology?

**Abstract**—Many hidden dimensions of architecture are perceived by mind but usually ignored during the design process; designers not often consider for instance, sensory and cognitive modalities as resourceful possibilities and solutions to creativity. In a Cinematic Aided Design research framework we can tap into the potentials of these hidden dimensions in the city through various filmic mapping techniques. Recently a different method of mapping and utilizing moving image as material for soft cinematic architecture is generating multidimensional perceptions between viewer and architectural surface appearance. This paper theorizes an innovative form of multimedia synthesis between image and sound, urban public art and architecture as projection mapping using contextual and/or non-narrative filmic contents. Today many cities create large-scale projector-based filmic displays that are ornamenting facades as performative urban screens. What kind of multimedia mapping is this moving image methodology?

**Keywords**—Projection Mapping, Cinematic Aided Design, Urban Screen, Architecture

I. **INTRODUCTION**

Film and light projection on the surface of buildings reveal the materiality of architecture in a dynamic or even as Walter Benjamin noted “explosive” renditions; hence, film can be a medium for writing and translation of concealed dynamics in the built form and understanding the myths, sensations, physicality and actions of architecture [10]. This new spatial perception requires understanding of the organization in different spatial parameters being sensed and perceived. In this theoretical paper projection mapping is paralleled with amodal translation of architectural space with real-time emotive forms. For instance, we can apply Roland Barthes’ *Writing Degree Zero* as model to conceptualize ‘cinematic architecture’ creating a transparent free-form of (reading and writing) functionless, ephemeral architectural appearances (projections), which are dynamic and real-time. In spatial analysis of projection, amodality works closely with haptic and kinesthetic modes; Brian Massumi also connects amodality to synesthetic suggesting improved sensory perception. A multimedia form of images and sounds can map these sensory/cognitive fusions and enhance our interfacing with the city and built forms.

II. **FILMIC MAPPING: SPATIAL MONTAGE**

In recent architectural works a sense of “spatial thickness” in appearance of architecture is provoked through explorations of many elements like transparency, reflection, gradation, and sensation of weightlessness [8]. A building can improve in sensual ways when designers are conscious of different gradations of transparency and juxtapositions, by creating altered thicknesses of spatial refinements and variations that have the sensation of movement and light in them. This kind of positive experience of space as Pallasmaa points out brings place and meaning more accessible and is a promising way of using interpretation of design. As a way of understanding the importance of sensory architecture we can use filmic parameters in a spatial design as temporal maps. In spatial analysis we use film as a methodology in research to divide a space into basic elements then build high-level concepts based on organisation of these elements. “By establishing a logic that controls the changes and the correlation of values” in spatialisation of digital moving image we create what Lev Manovich calls “spatial montage” [3]. Digital film helps us systematise spatial data and visualise them as digital information maps. Pallasmaa claims that architectural discourses are mainly engaged in “mapping the possible marginal territories of the art that responding to human existential questions” [3]. He is blaming many unrelated augmentation of imaginaries as slowly taking the emotional content of images and making them less meaningful, as just another commodity manufactured for another boring experience; calling to attention that architecture has become an endangered art form in this age.

Cartography is the process of converting reality into what we call maps and by way of using abstractions this gives us an image of our space, place and cities. However, projection mapping of multimedia transforms data maps into reality and information into physical space; so it’s a reverse process. New media artist Pablo Valbuena expresses the interior as well as the exterior of architecture by projections that transform architectural parts, urban furniture such as concrete benches, tiles into mapping surfaces and augmented sculptures. The spatial mapping projection on building’s facade and objects becomes an extension of the facade, by ‘wrapping’. Both wrapping and unwrapping concepts can be valuable as cinematic aided design methodologies sharing amodal characteristics that involves sensory and cognitive realms of deciphering space using film as hieroglyphic medium of exploring the city and its architectural appearances. Soft architectural enmeshment is a term I’d like to associate with projections that are ‘trans-morphing’ filmic skin into facades.
The cinematic effect of this mapping is as if building is possessed, or entangled in a dream. The precision of the mapping takes the viewer to an amodal state where it affects our perception. 555 Kubik (2009) projections on Gallery of Contemporary Art for the client Kunsthalle in Hamburg was realised by German company Urban Screen is an example of trans-morphed (‘act of temporal change’) on the materiality of a building in direct relation to filmic space, time, as digital mapping algorithms. The square gridded building is dynamically ‘wrapped and warped’ by geometric data from structural analysis of the building into “newly interpreted freely conceptual and geometric approaches.”

III. PROJECTION MAPPING AS DEGREE ZERO ARCHITECTURE

Film gives us privileges in cognitive and sensory investigations of architecture in the urban environment. Can exploring film as spatial interface help to sensitize our vision towards the space? We propose that film can be a degree zero in writing about spatial, temporal phenomena that connects to sensory modalities and cognitive amodal perceptions; here degree zero means that point where designers can freely cross-synthesize, explore, deconstruct and let their imaginations flow. How does architecture reinvents its appearance in film and reality? Real-time mapping buildings through multimedia projection on facades are a make-belief state of cinemagic (Georges Méliès) and augmented reality from the viewer’s (designer) vantage point.

The existentialistic qualities of film and architecture are in the freedom of expression of one medium to another which is hampered by architectural rules and regulations. Putting all these behind us we purely explore the meaning of architecture in mind as perception. This purity gives us multimodality in multimedia where architecture’s plasticity is in its inherent dimensions. Today the connection between visible and tangible needs to be addressed and explained as separate dimensions, to have antithesis, an anti-architecture solution for testing the stylistic boundaries of design.

In Writing Degree Zero Barthes talks about a mode of neutrality of a zero element in linguistic term, a freedom from bourgeois style. Zero as a “style of absence which is almost an ideal absence of a style” [2]; he describes degree zero as “disengaging” [2], a rebellion. Through this ‘degree zero’ lens a designer wants to communicate a sort of true purist and freeform architecture; at degree zero creativity one will need to established connection with existential nature of architecture when it becomes simplified into pure sensory and cognitive objectives as a method of investigating as well as creatively conceptualizing the built form. As Barthes suggests a “genuine appearance of many-sidedness” [2] and freedom should be associated with this sort of design, temporarily disengaging architecture from its rules and regulations creating an imaginative architecture.

IV. ARCHITECTURAL APPEARANCE AND AFFECTS IN FLUX

Cities have long used the multimedia effects of lights, shadows, sound and movements to extenuate the appearance of its buildings in site-specific installations. Powerful projection of searchlight beams into sky or buildings are still common in city downtowns. Dietrich Neumann explains the early architectural external lighting as an urban phenomenon that augmented building characters at nights. They were first used at the World Trade Fairs of Paris 1889 and Chicago 1893 to illuminate various exhibition buildings [4]. In 1899 searchlights where projected at angles from both sides of the East River, New York to create “what looked like ribs of a vaulted arch,” [4] and possibly it was the first artistic installation to celebrate the return of the American fleet after the success of the Spanish Civil War [4]. Not until now it has been possible to clearly change the appearances of architecture so fluidly andbelievingly using projections. In 1912 The Seaman’s Church Institute, New York produced a Titanic Memorial Lighthouse Tower. This was one of the first times light beams were projected into the sky as memorial similar to the New York’s World Trade Centre’s Tribute in Light (2002). Searchlights and lighting projections are the predecessor of projection mapping.

Today digital multimedia artists and architects can augment an existing structure with mapped projections despite its size. Architectural appearances can be often invoked by different social, cultural and political origins. Temporal changes to appearances of architecture even due to weatherization, decay of time, graffiti and vandalism may affect us; yet through projection mapping city appearances can change the bodies’ experiences in performative and dynamic ways. The soft architectural phenomena as projection transforms the volumetric, texture, and weight characteristics of architecture into non-permanent alterations that we can evaluate and even translate individually or collectively. The spatial qualities of every particular architectural surface can be a new map that presents new appearances. This useful non-permanent alteration is a way of tapping into the hidden dimensions of architecture even after they are built, through filmic mapping. Virilio suggests that filmic techniques become an “open system” where anything is possible and it is no longer a matter of “depth of field or perspective” rather, that it is field of limitless perceptions and structures [10]; hence, film can be a medium for de-codifying architecture understanding its myth as well as its performative actions.

In film through montage we can create worlds that physically aren’t possible, by simultaneously depicting multiple images into a single space superimposed to create “ontological montage,” as Manovich explains similar to Rybczynski’s Tango (1982) [3]. Ontological montage is to radically juxtapose different realities within a single
space/image. Likewise projection mapping uses spatial montage in its programming of surface and space modulations however, the seams and boarders between different compositing layers are mapped and calibrated through the projection device prior to performance. These techniques in manipulation of cinematic features lead us to new diverse architectures in inexpensive and intuitive ways, creating perceptually amazing results. Its non-permanence gives it illusionary quality that is an inherent part of the fleeting moving images on the screen. During a projection performance, it can be reflexively experienced and evaluated through documentation and a range of experimentations using film. As part of cinematic aided design it expands the space for new simulation of architecture, the same way that in early 90s Jeffrey Shaw used filmic and cinematic visualizations. In a multimedia installations titled Place - a user's manual (1995) a way of augmenting the real space blurring the seams between real and virtual are questioned as the “physical arrangement in the virtual space is dynamically determined by the viewer's movements.” Haptic senses of contact with the scale of projections create the perception of semi-immersive spaces. New media artists are currently doing interactive mapping versions creating interfaces and constructing phantasmic and imaginative cityscapes controlled by tracking the public audience. These are usually performed at nights when we have the black canvas of darkness and the light and shadow-play becomes a synesthetic medium for haptic and other modalities to synthesize new spatial appearances.

V. AMODAL MAPPING: FUSION OF SENSES

Amodal Perception and Completion is the spatial organization of objects in mind when partially seen or hidden by obstacles; thus, amodality can be considered in a research as semantic perception of architectural experience, and as representation of architectural regions as filmic surface planes, transversely mapping surface form and its meaning. Artists projecting augmented spaces as a real-time transmorphing act of change which takes place between skin of the film and the skin of a building, revealing amodal maps that otherwise are permanently hidden. For artists and designers amodal can link virtual to the physical; as a proposed cinematic toolkit for design in digital moving image systems amodal research can bridge the perception gap between deep space of filmic and physical spaces.

As Brian Massumi suggests amodal above all is a matter of philosophy which also lies between fusions with psychology of perception, sensory, and thoughts. In mainstream films the narrative is the most powerful mode of sensory control—if sound is stopped and viewed without audio the usual modal senses create interesting amodal perceptions i.e. the off-the-frame actions and mise en scène become more pronounced. “What lies transitionally between modes is amodal,” a symbolic representation of sensory fusions [5]. Site-specific works of Raphael Lozano–Hemmer create amodal fusions between the physical and virtual through connections between remote locations and users mediating his installations by Internet. He called the series “Relational Architecture.” Vectorial Elevation and Amodal Suspension are interactive installations transforming the city sky at night using multiple robotics searchlight beams that respond to text messages sent by people from a website. It was performed for the opening of the Yamaguchi Centre for Arts and Media in Japan in 2003. Massumi writes Amodal Suspension “requires us to reassess our notion of the analog and the digital, of language and code, meaning and force, human and non-human communication” and Lozano–Hemmer does this by aesthetically connecting “communication to its outside” [5]. In spatialising film we objectify it. In research we can combine perceptual with sensual, amodal with modal, and relate “fusion of senses” [6] with blending of senses (e.g. synesthetic, kinesthetic, and haptic).

VI. SOFT CINEMATIC ARCHITECTURE

Projecting film on 3D surfaces verses 2D screens requires a different spatial perception. The audience point of view and the screen in 3D world is a semi-immersive experience that allows our amodal tendencies to complete an imagined perception. A sort of soft data architecture is revealed on the surface of the film and now on the architecture as haptic imagery. Plasticity of architecture is returned to sensory grandeur between the texture of spatial screens where the real and fictional boundaries are blended, reshaped and their plasticity become evident in their visual forms. Pascal Schoning mentions Le Corbusier as having envisioned the spatiality which was “constantly changing in its appearance – a cinematic experience” [9]. He relates this materiality as energy released. Perhaps this is why Le Corbusier liked film as a way of visualizing architecture since it represented more closely his idea of plasticity in form. As Schoning also points out cinematic architecture’s expressive language mediates between perception and projection, in other words mental and physical. It is in our minds that architecture synthesizes its plastic spatiality and in film architecture becomes a representative of its space as energy. “Cinematic architecture confronts the stable with the temporal” [9], it is a form of physical dialogue.

Learning digital multimedia concepts which involve programming complex architectural effects as Jean Nouvel says is of interest to today’s architects; effects such as transparencies are common, it involves layers of light as materials in design. Ephemeral effects are ways of

Figure 2. Amodal Perception & Completion: perceived organisation of objects in space
programming buildings “differentially over time and play with temporary effects” as traditional architecture Nouvel says, plays with the idea of permanence [1]. Today’s designers want to take advantage of temporary and subtle effects that can explore the sensory and sensual aspects of architecture by testing its physics, its continuity in time space, as well as thinking of skin-like dynamics as in transparency, light as ways of complex programming different appearances. Cinematic architecture experiments with ideas like depth of field and other haptic senses of space that are drawn through our body. The multimedia projection embodiment of space is spatialising film by connecting evolutions between time and space, matter and light, sound and image, motion and emotion that continue evolving.

VII. Soft Ornamentation

Farshid Moussavi of Foreign Office Architects (FOA) says the modernist obsession with transparency was meant to make architecture more sincere, pure and visible whereas “ornamentation” and decor according to Robert Venturi was a better choice of blending cultural expression with the urban sense. Through this expression buildings communicate with wider public, and cultural expressions [7]. Projecting and animating facades create sensual and temporal soft ornamentation that focuses public arts on architecture and art fusions. It is a positive way to involve people in city spaces.

Our relationship with reality is being desensitized in architecture and other contemporary cultures such as the arts [8]. The arts have been conceptualized but there emotional content and the embodied responses through senses are regularly being left out “like gradual emptying of images of their emotional content” [8]. He is suggesting the linking of art and architecture with “culture and a mental reality” [8] as a more desired way of understanding it, therefore what Pallasmaa and others are concerned that architecture is an endangered art form by referring to disappearance of the soft architecture that our minds could envision. It is losing its sensuality and embodied essence of place that gives us sense of place, progressively in a contemporary city we are disembodied and detached from the built form. How can projection mappings using digital multimedia improve this link?

Ornaments create rhythms that connect the surfaces to bodies and to senses. In 1940s Sir John Summerson’s essay Heavenly Mansions described ornaments as “surface modulations” similar to the surface of film. Today the modernist fear of ornamentation is slowly fading as sensory debates, and topological connections with cultures and societies make designers reconsider and resample a new digital ornamentation in the form of multimedia. Perhaps the most famous ornament related argument is Adolf Loos Ornament and Crime (1908) essay. He set the path for future modernist vision and mentality towards ornamentation as a degenerative, senseless, and superfluous time consuming feature. This began the conceptual and experimental approaches toward new architectural design standards that became the norm. One of the technologies that represent ornamentation is film, where it can represent a non-static surface of ornamental modulation as a performative surface. The contemporary definition or position of ornaments on buildings is of its topological capacity and the surface of built form has become a critical domain to investigate its surface performance and the role of new digital multimedia in architecture.

VIII. Conclusion

An architectural sensory translation of projection into expressive multimedia mapping has future dimensions in film, architecture, and the city. Ornamentation was disregarded and not considered appropriate traits of modern architecture due to its references to history and various other visual and sensory limitations; however, there is a comeback of ornamental sensibility for architectural exterior in the form of multimedia projection mapping that is not permanent yet greatly diverse and flexible. This kind of ornamental enmeshment created by projection is indulgence for the eye and equally for the mind, freeing the obligations and spatial restrictions with the architecture and it makes us neutral towards all possible risks. It is a sort of degree zero arrival at any type of architecture this helps us create radical and free-form architectural gestures that are expressive and flexible. One of its improvisational aspects is transparency which traverses through all modalities such as synesthetic and kinesthetic to amodal cognitive perceptions of objects in space and their trans-morphing potentials. An interface to the appearances of architecture is film as maps or topographic surfaces and as interface for perception of “architectonic form” [10].

We hypothesized with amodal perception as mapping ‘degree zero’ architectural affects through digital projection of emotive visuals. This form of cinematic aided design should be recognized as a research tool in environmental design. Amodal is both philosophic and psychological, both cognitive and sensory; it’s a way to deal with the sensory possibilities of architecture through spatialising vision and other modalities. Cities are filled with architecture and spaces that inhabit them, and people animate their cities in real-time spaces. Projection mapping creates soft cinematic architecture that is a new multimedia wave in visualizing the skin of the city and architecture.

REFERENCES