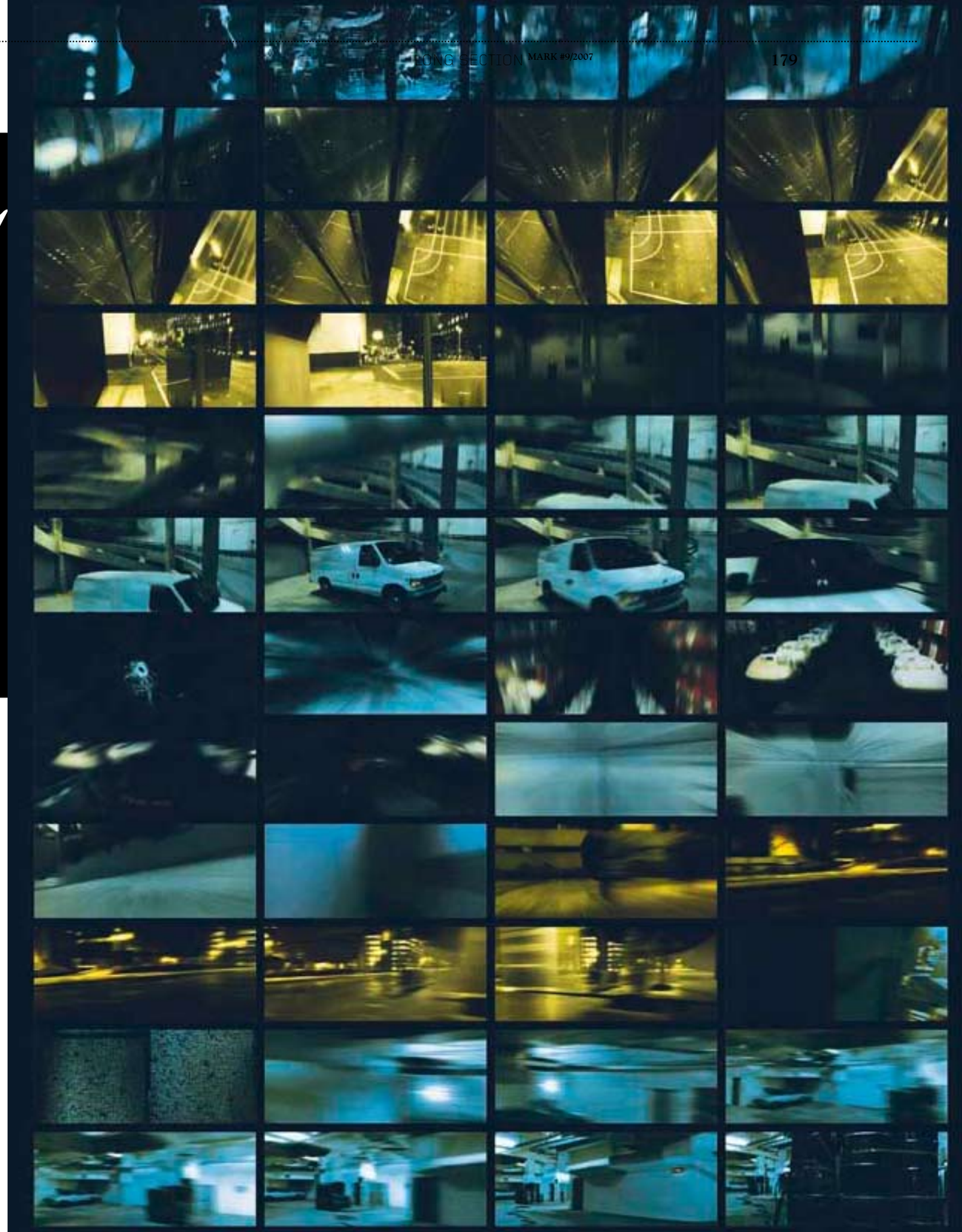
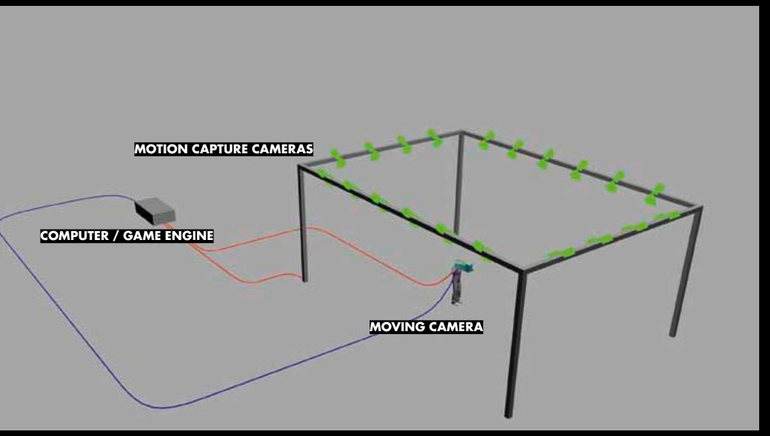
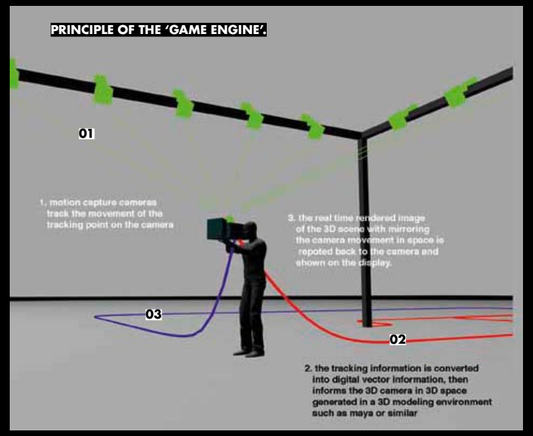
TOWARDS A CINEPLASTIC ARCHI-TECTURE

ACCORDING TO TINO SCHAEDLER AND MICHAEL J. BROWN – ARCHITECTS NOW INVOLVED IN FILM – IN THE MOVIE INDUSTRY, THE DIGITAL REVOLUTION IS SPEARHEADING A NEW KIND OF ARCHITECTURE THAT CENTRES ON DYNAMIC PERCEPTION.

TEXT TINO SCHAEDLER AND MICHAEL J. BROWN







PREVIOUS PAGE **OPENING SCENE FROM DAVID FINCHER'S *FIGHT CLUB*, A FILM THAT FEATURES INCREDIBLY COMPLEX AND FAST-PACED CAMERA MOVES, INCONCEIVABLE WITHOUT THE ASSISTANCE OF PRE-VISUALIZATION, A TECHNIQUE IN WHICH LOW-COST DIGITAL 3D ANIMATION AIDS THE FILMMAKING PROCESS BY CREATING ROUGH VERSIONS OF THE SHOTS IN A MOVIE SEQUENCE. THESE ICONIC CAMERA MOVES PENETRATE BUILDINGS AND SPACES WITH AN UNPRECEDENTED DYNAMIC FLOW.**

01 (GREEN): MOTION CAPTURE CAMERAS TRACK THE MOVEMENT OF THE TRACKING POINT ON THE CAMERA.

02 (RED): THE TRACKING INFORMATION IS CONVERTED INTO DIGITAL VECTOR INFORMATION, THEN INFORMS THE 3D CAMERA IN 3D SPACE GENERATED IN A 3D MODELLING ENVIRONMENT SUCH AS MAYA.

03 (BLUE): THE REAL TIME RENDERED IMAGE OF THE 3D SCENE THAT MIRRORS THE REAL SPACE CAMERA MOVEMENT, IS REPORTED BACK TO THE CAMERA AND SHOWN IN THE DISPLAY.

ABOVE **THE NEWEST DEVELOPMENT IN FILMMAKING, SO-CALLED 'GAME ENGINES', ARE USED TO LOAD VIRTUAL SETS AND MOTION-CAPTURED ACTORS' PERFORMANCES INTO A SYSTEM CONNECTED TO A CAMERA VIEWFINDER. THE DIRECTOR CAN WALK WITH THE CAMERA THROUGH SPACE, WATCHING THE OVERLAPPING DIGITAL SET AND REAL SET RESPOND IN SYNC. THIS ALLOWS HIM TO RECORD ACTING INDEPENDENT OF PRESET CAMERA PERSPECTIVES WHILE MAINTAINING A HIGH LEVEL OF CINEMATOGRAPHIC FREEDOM. CURRENTLY WORKING WITH THIS TECHNIQUE ARE ROBERT ZEMECKIS, WHOSE FILM *BEOWULF*, DESIGNED BY DOUG CHIANG, IS SCHEDULED FOR RELEASE IN NOVEMBER 2007; JAMES CAMERON, WHOSE FILM *AVATAR*, DESIGNED BY RICK CARTER, IS EXPECTED IN 2009; AND STEVEN SPIELBERG, WHOSE NEXT BIG PROJECT IS *INTERSTELLAR*.**

ABOVE **STILL FROM JOSEPH KOSINSKI'S TRAILER FOR THE GAME *GEARS OF WAR*, AN EXPERIMENT WITH THE NEW 'GAME ENGINE' TECHNIQUE.**

PHOTO **JOSEPH KOSINSKI / MICROSOFT / EPIC GAMES**

WE NAIVELY EXPECT THE STORY TO BE told like any other: an even, chronological unfolding of events. And yet the opening scene of David Fincher's *Fight Club* promises a film that is anything but the usual fare. It begins as we emerge micro-sized from a pore on the protagonist's face and slide up the blurred outlines of the pistol in his mouth. He exchanges a few lines with his alter ego as the camera slides through the exterior façade to view a menacing Tyler Durden back through the reflective glass. With an unexpected jolt, we drop 20 storeys to street level and intangibly slice through the pavement into the multistorey parking garage below. A seamless blending of real and digital segments allows us to visually continue the demolition's narration by flying through a bullet hole in a parked van's windscreen to finally witness its load of explosives. Beautifully executed and skilfully conceived, this opening is radically removed from any route we could actually 'experience', yet it remains eerily intuitive. Ignoring conventions of distance and time, Fincher's masterful camera work weaves through different scales and spaces to reveal the narrative along its own unique timeline. He builds space not with montaged snippets, but through carefully constructed continuous shots, captivating the audience while surreally recasting our view of the world. More subtly, by surpassing our common experience of architecture, this choreography introduces the poetic, indivisible union of space and time inherent to film.

OUR PERCEPTION IS NEVER STATIC; EVEN WHEN WE SIT MOTIONLESS, OUR GAZE WANDERS, ACTIVATING THE SPACE AROUND US

It is a development that was foreseen by art historian Elie Faure, who in his 1922 treatise *De la Cineplastique* wrote: 'With the notion of duration entering as a constitutive element into the conception of space, we will easily imagine an art of "Cineplastic" blossoming which would be no more than an ideal architecture.' Owing to recent advances in digital technology, Faure's treatise now more than ever provokes a new perspective on the relationship between architecture and film.

The concept of cineplastic space hinges on illustrating the complex symphony of phenomenal impulses that we define as spatial perception. It is through our wandering eyes – scanning the sensations of colour, proportion and rhythm – that we read and define space. Our perception is never static; even when we sit motionless, our gaze wanders, activating the space around us. Like a moving film camera we experience our own continuous film of fluid, dynamically unfolding volumes, montaged by the blinking of our eyes.

Cinema proved to be both rapid and prophetic in its transition from abstract, static notions of space to naturalistic and dynamic modes. Especially after 1906, the year the camera was freed from the tripod, cinematic space exposed the indivisible union of space and time. While early films represented scenes from an unflinching frontal perspective, akin to filmed theatre, the transition to complex interweaving of views and montaged narrative took only a few decades – progress not lost on other media. Prose literature, such as Virginia Woolf's *Mrs Dalloway* (1925), and works of art like Duchamp's *Nude Descending a Staircase* (1912) echo these new perceptions with their attempts to capture the temporal. Yet, with a few exceptions, this idea of dynamic perception has eluded architecture.

Cineplastic architecture regards time as the natural dimension of form; it's an architecture in which form is animated by time rather than being its passive receptor. Yet only a few exceptional buildings incorporate elements of movement and pace. Hans Scharoun's National Library in Berlin, Frank Lloyd Wright's Guggenheim Museum and Foreign Office Architect's Yokohama Port Terminal are exceptions shaped by movements of different speeds, celebrating an immanent union of time and form. Conceived in the cineplastic mindset, they determine your perception through their internal script, directing your sight and varying your direction, speed and at times your posture. They introduce certain parts of the whole, while concealing others to present at a later moment. In short, the experience of the building becomes inseparable from your cinematic momentum through it. Yet, what tools can be employed to grasp this new conception of space and architecture?

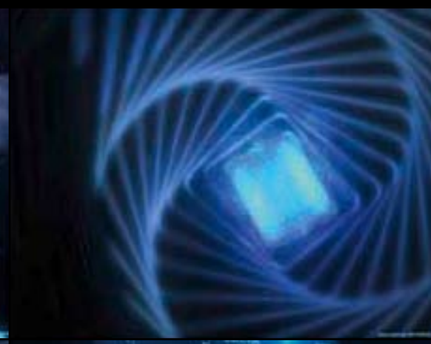
In his book *The Projective Cast* (1995), Robin Evans traces the intimate bond between architectural design and its means of representation. The architecture we create cannot be separated from the means by which we represent (and thereby evaluate) it during the many steps from inception to realization. Thus the development of an architecture of the cineplastic must include a rethinking of our own methods.

Prior to the introduction of digital computing and the filmic possibilities it offers, projective geometry provided the common design language. Its main assets – plan, section and elevation – are static projections promoting an inert notion of space within the constraints of Euclidean geometry. With few exceptions, such as Arab and Japanese architecture, this correlation has ruled architecture's history. The invention of linear perspective drawing in the 15th century, for example, saw an explosion during the Renaissance and baroque periods of axial architectural and urban compositions meant to be enjoyed from a few set vantage points. This medium, supplemented by architectural photography and technically eased by the computer, remains one of the high points of architectural representation today.

Yet there are signs that both the methods and concepts of cinema are slowly crossbreeding with architecture to create a new, more complex conception of space. In film, storyboards have been the means of choice for years to visually conceive story lines in their temporal and spatial dimension. By breaking down the fluidity of time-space into keyframes, storyboards relate to the architect's use of perspective drawing, yet they are an evolutionary step closer to designing with a dynamic notion. Le Corbusier and Bernard Tschumi applied the technique of storyboarding in their designs for Villa Meyer and Parc de la Villette. Both are great examples of architecture conceived as a sequence of framed views arranged along a linear path. Although time is incorporated as a design factor, it is still at a photographic level since motion and instantaneous sections of space remain as separate entities.

Zaha Hadid's recent explorations in axonometric and perspective projection more fluidly illustrate the correlation between representation and design. As Patrik Schumacher traces in *Digital Hadid*, what started as a primarily graphic vehicle adding dynamic flavour to presentations evolved into a sophisticated tool to develop expressionist forms. Her vast painting studies merge multiple perspective constructions into a distorted, seamless, animated carpet. Schumacher understands these images 'as attempts to emulate the experience of moving through an architectural composition revealing a succession of rather different points of view'. As such, they close the presentation/generation loop and mark a notable evolutionary step beyond traditional single-viewpoint architectural strategies.

In the late 1960s, Californian landscape architect Halprin developed a graphic system called 'Mo-tation': a combination of the words



THIS SPREAD **NAU ARCHITECTURE RECENTLY DEVELOPED 4D MODELLING, A TECHNIQUE THAT PUTS DYNAMIC PERCEPTION AT THE CORE OF DIGITAL, VIRTUAL DESIGN. ORIGINALLY USED TO DESIGN STADIUMS FOR A FUTURISTIC AMERICAN-FOOTBALL VIDEO GAME, 4D MODELLING ASSUMES GAMING'S UBIQUITOUS 'FIRST-PERSON' NARRATION, ANIMATING VARIOUS CAMERA PATHS THAT SIMULATE THE CHARACTER'S FUTURE/POSSIBLE MOVEMENTS.**

movement and notation. This technique is similar to storyboarding, but allows for more fluid conception since it is thought as a timeline rather then keyframes arranged along a timeline. Halprin's system is helpful as a graphic device to notate, but misses to potential to visually explore unforeseeable dynamic phenomena inherent to cineplastic architecture. If we stay with the analogy of music notation, it offers a means to notate the score, but we are missing the instrument to experiment with.

Real innovation has occurred in recent years as rapid advances in digital technology have made possible inclusion of dynamic perception as part of the design process, while modelling and fabrication tools have opened new modes of conception and geometry. Greg Lynn, in particular, has experimented with ideas of integrating time into spatial design. His approach, however, is not perception based, but rather focused on parametric simulations of future forces within the design process. In regard to cineplastic architecture, animation tools of software packages developed for the film industry, such as Autodesk Maya and Softimage, offer interesting possibilities that have rarely been explored.

Through the integration of digital innovation, filmmaking of the past decade has entered a new era. While breakthroughs like *Jurassic Park* set milestones for photorealism, hyperrealism films like *Sin City* or those of David Fincher use the medium to project worlds beyond everyday reality. As expressionist film of the 1920s inspired Faure to instigate a new architecture, so too does this new era in film – the digital era – offer new inspiration for architecture. The techniques used to conceive film have generated new aesthetics and viewing conventions for designers and 'viewing public' alike. Unlike the situation in 1922, however, these fields of stimulation extend beyond the film-architecture pairing to embrace video-game design and vast online worlds – terrains that can be harvested by architects to push the ideas of cineplastic architecture.

CINEPLASTIC ARCHITECTURE REGARDS TIME AS THE NATURAL DIMENSION OF FORM; IT'S AN ARCHITECTURE IN WHICH FORM IS ANIMATED BY TIME RATHER THAN BEING ITS PASSIVE RECEPTOR

One technique used by progressive directors like David Fincher employs the extensive use of pre-visualization during film production. Pre-vis is a technique in which low-cost digital 3D animation aids the filmmaking process by creating rough versions of the shots in a movie sequence. Fincher's films, such as *Fight Club* and *Panic Room*, feature incredibly complex and fast-paced camera moves, inconceivable without the assistance of pre-vis. These iconic camera moves penetrate buildings and spaces with an unprecedented dynamic flow. Unlike the keyframe nature of storyboards, pre-vis offers the full potential to design in real-time 4D, holding great promise for the design of true architectural time-spaces.

Another technique integrates gaming technology into film production. James Cameron and Robert Zemeckis recently began using so-called 'game engines' to load virtual sets and motion-captured actors' performances into a system connected to a camera viewfinder. The director can walk with the camera through space, watching the overlapping digital set and real set respond in sync. This allows him to record acting independent of preset camera perspectives while maintaining a high level of cinematographic freedom. At the moment, technical limitations allow for a real-time display quality equivalent to that of simple video games. But considering the rapid pace at which digital technology is evolving, we expect major improvements allowing photo-realistic display in the near future.

As one might expect, these applications are gradually spilling over into the grey margins of the architectural world. Nau architecture recently developed an approach, aptly named 4D Modelling, which puts dynamic perception at the core of digital, virtual design. Originally used to design stadiums for a futuristic American-football video game, 4D Modelling assumes gaming's ubiquitous 'first-person' narration, animating various camera paths that simulate the character's future/possible movements. The designer runs through these cameras' perspectives, roughs out the geometry and gradually refines it with details that sculpt the experience into the fourth dimension. The result is virtual spaces that reveal their depth and variety only through the player's movement across the field. His speed and view angle vary the user's spatial perception, making surrounding stadium forms seem to flow like smooth sequences of looping waves – a true cineplastic architecture.

Such experiments are redefining the use of animations in architectural practice, elevating and liberating them from roles as a stale presentation medium – i.e., uninspired fly-throughs – and embedding them directly in the design process. Techniques like 4D Modelling allow architects to develop a design intuitively in terms of storytelling and temporally unfolding composition, closer to the work of an animator than that of the traditional 'master builder'. Architecture can be planned as an event, integrating aspects such as the change of lighting, texture and surface.

It is only a short step to foreseeing a fusing of these technologies to allow for interactive evaluation of a design, on-site and real-time. Design media will cease to be simply reduced, abstracted sketches of reality and become parallel, overlapping versions of it. Beginning with a 3D model of the site, architects will be able to develop their script for the building, evaluating various speeds, approaches and lighting conditions. Before thinking about architecture per se, they can focus on movement into and up through the building, blocking out the basic geometry and pathway. With an advanced game engine, our future architect will explore the building on site through a visor, tuning the interior and exterior as an assistant makes real-time adjustments. Transfers between real and digital modes continue throughout the design process, in each step educating and surprising the designer. New, more nuanced conceptions of space emerge, not only because technology allows them to be discovered and evaluated, but also because architects are freed from line and paper in the first place.

Architecture has certainly had its fair share of prognosticators, and clearly the ideas offered here cannot be applied to every architectural task. However, there is an increasing amount of traffic between the worlds of film and architecture. Without a doubt, the cross-fertilization of these fields will provide the tools and concepts to feed both architects eager to make new spaces and a public conditioned by popular culture to hunger for them. The fusion of filmic and architectural worlds will finally make possible Faure's cineplastic vision – but perhaps in ways he never imagined.