Resisting the smooth

Time-based interactive media in the production of distressed space

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Abstract. Time is central to architectural design, but to date has not been fully investigated through computational media. The works of Heidegger, Bergson, Virilio and Deleuze suggest that the study of the elusive concept of time has more to contribute to an understanding of the human condition than space. One can argue that contemporary society is being governed increasingly by temporal structures, as the space of the town square is replaced by time-based broadcasting and digital communications. This shift from space to time is commonly associated with the ideal of smoothing boundaries and developing seamless environments. Contrary to this supposition, we propose that the putative "collapse" of time and space exposes disjunction and disruption. We develop the notion of "distressed space" as part of a design strategy in the context of time-based media. We draw on examples from real-time 3D animation using the MAX/MSP/Jitter programming environment and discuss some of its implications for design.

Keywords. Jitter; time-based architecture; distressed space

Seamlessly Smooth

Tangible computing ... attempts to exploit our physical and spatial skills and to extend interaction into arenas where these skills can be brought to bear for smoother and more natural forms of interaction and expression. ... it sets out to unify computational experience and physical experience, ... It attempts to unify the physical and electronic worlds to create a blend which is more closely matched to our daily experience and abilities. (Dourish, 2001. p.189-190)

The promise for seamless integration between the physical and the virtual drives much of the research in interfacing digital technologies (the virtual) and humans (the physical). The development of tangible computing is a clear indicator of a tendency towards techno-human environments which are integrated, seamless and smooth.

Gregg Lynn's work provides insights into an architectural rendition of the seamless. Characterised by smooth surfaces, metaphors of organic growth, responsive and integrated surfaces, Lynn's design process represents an exercise in averaging. The articulation of the smooth is in fact one of reductive resolution as the angle is replaced by curvature, difference is read as a state within a process of continual mutation, and the human, technological and architectural emerge as states in a seamless, integrated environment. The notion of parametric architecture (Senagala, 2002) – a responsive architecture that draws on the possibility of interpreting incoming data (contextual parameters) – commits the designer further into a process of polite integration. The designer negotiates the type variance

attributed to each interactive parameter, the most likely result being an interpolated series of deformations/mutations, which intimate distress but commonly result in variations on the theme of the "blob" (Giovannini, 2000).

In contrast to this ambition towards the smooth, there are numerous examples of tools and technologies the use of which seems to rely on the obviousness of the seam, the conspicuous and distressed relationship between the performer and instrument. Tools, technologies and apparatuses used in painting, sculpting and music performances are often uncompromising when it comes to a potential merge with the human. A violin, played at professional standard, can be likened more to a localised instrument of torture (with its complimentary disciplinary rewards), than a harmonious continuation with human agency. Why is there no impetus to develop a violin that blends ergonomically with the player?

Validating a project based on its ability to fuse with the human senses, in all their sophistication and complexity, seems to be amplified in the digital domain. The state of the digital computer is grounded in incremental development — continuous, compatible, integrated, seamless development. This process can be connected with the notion of speed. The digital is faster; network rates and processor speeds are fixed on a path of acceleration. The smooth and the seamless are ultimately made possible by a system which developed from the discrete to the continuous. It is worth considering how this primacy of time and continuity is related to human-technology configurations.

In the context of computer aided design, it could be argued that the standard 3D modelling and rendering software package is to some extent responsible for a propensity towards the smooth. A quick survey through packages currently used in architecture would no doubt confirm a tendency towards the development of tools that facilitate processes such as meshing, the creation of nurbs and the control of smooth surfaces and volumes. In addition to this form of smooth sculpting, these packages offer linear and "faired" animations which represent yet another capability in the smoothing of trajectories, view points and navigation. The smooth has also become a way of demonstrating computational power, speed and sophistication (Coyne, 2002). The smooth is well served by technological advances. How can we focus on the design of the distressed, the disjointed, the dis-continuous?

We suggest that the continuity implied in designing spatial form can be troubled, resisted and ameliorated by an articulation of time in the design process. The notion of "real-time" (information that is updated at the same rate as it is received) offers possibilities in rupture, fragmentation and discontinuity; invading and propagating the condition at the edge of the smooth.

Simultaneity

In his discussion of the work of Benjamin and Virilio, Manovich (1996) notes significant similarities in both authors' approach to "the intervention of technology into human nature." He points out that both Benjamin and Virilio equate our perception of the natural with spatial distance between the observer and the observed. Technology (film for Benjamin and telecommunications for Virilio) reduces this distance. The fact that anything can be transmitted anywhere at the "speed of light" makes the notion of distance redundant in what Virilio calls Big Optics. This condition assumes the collapse of the spatial dimension altogether. Distance and the inevitability of time delay that once provided the opportunity for assimilation and reflection cease to exist. With instant communication comes instant reaction times, a feedback loop that ultimately can only be handled by

computers. Whereas the collapse of distance is, for Benjamin, marked by the development of film and its ability to represent different spaces at the same time, Virilio transfers the collapse of space to telecommunications. The richness of our perceptual field is diminished (removing what Benjamin calls "aura"). Distance can, on the other hand, be seen as responsible for a gap, a separator in the observer-observed continuum. It can place the observer in a privileged position and renders the observed as a static entity. As our opening quote shows, research into "tangible media" (HCI) interfaces seems to accord with this promise (or threat) of sensory immediacy.

Regardless of the value judgement attributed to distance, its "collapse" implies a condition which conflates the observer with the observed, the human with the machine, the subject with the object. This conflation transforms previously discrete dualities into smooth ambiguity, a blurring of meanings. The connections that result from the collapse of distance become responsible for configuring the smooth interface. For "smooth-HCI" and tangible media, the collapse seems to serve the cause of the smooth, as a precursor to a new and more effective embodied and integrated interface. Of course, this conflation also becomes responsible for rupturing and unsettling the interface; in the manner of a collapse, it becomes a major contributor to distress.

Time-fractured

The greatest potential for realising spatial and temporal discontinuity is when space and time are processed in relation to each other. Film can use time to render spaces disjoint. Instead of the broad sweeping panorama (smooth), filmmakers cut from one scene to another. Instead of conveying a scene as one continuous time sequence they introduce an element of temporal disruption by switching from one spatial location to another. We note Alexander Sokurov's "The Russian Ark", filmed as one continuous 90 minute take, and spanning several centuries, where the "cut" is achieved at the threshold, the doorway, the passage, or the gaze that lingers (on a painting), and from which we awake to a new time frame. Of course cuts can be used to convey a sense of the smooth. Perhaps in a film and MTV-enculturated world everything is cuts. Whatever the "impression," be it of smooth or distressed, the effect takes place at the cut, the conflation, and this is time-abetted. In any case, it is a temporal plus spatial control that gives new media its power, an effect enjoyed less by traditional painters, musicians and architects.

Temporal 3D Environments

What kind of spatial exploration results from an interface that privileges the time aspect? How does the designer gain access to the unmaking of smooth space, the fabrication of distressed geometries? How does the designer play with distress and disturbed unities? One answer resides with time-based media.

Real-time three-dimensional technologies have only recently become part of the designer's tool box. Digital tools that are now commonplace suggest functions and processes that typically become extensions of traditional design practice. An architect might use 3D modelling software at various stages during the design process. The ability to mould and shape surface and volume is provided as an extension to traditional physical model making. The promise for photo-realistic visualisation comes as a well-received technological "improvement" on drawings and perspectives. The smooth ideal draws on metaphors of creation, process, evolution that pertain to temporal-continuity (Lynn) whereas the distressed exploits intervention, disruption, event-based discontinuities, the non-linear and the non-local

(Novak, 1996).

A quick survey of real-time 3D authoring technologies presents at least two possibilities for the digital designer who wants to engage in the time domain implications of architecture. Macromedia Director's Shockwave 3D exposes a series of 3D primitives, user behaviours, 3D animation strategies and even a real-time physics simulation engine (Havok). Shockwave 3D has been used by designers of computer games that, due to Shockwave's standard specifications and increased computational power of the average PC, can distribute and play their environments online. A more event-based approach was recently developed by Cycling74, and takes the form of a set of programmable objects which are an extension to the Max/MSP graphic programming environment. Jitter is a collection of 130 or so standard objects which deal with time-based graphic content. Subsets of these objects are dedicated to video processing, data manipulation, and 3D Open-GL programming and rendering. The Max/MSP/Jitter user community is mainly composed of artists, musicians and programmers who develop applications for audio and video processing, interactive installations and audio-visual performance. In what follows we refer to examples that use the Jitter Open-GL objects.

Max presents the user with a graphic interface in which boxes with inputs and outputs are connected (following the metaphor of circuit design). Each set of boxes (patches) can contain any number of nested boxes (sub-patches) and communicate with them at various rates. Its design is primarily for time-based applications and therefore follows a strategy of rapid prototyping which to some extent by-passes compilation and de-bugging, hence exposing the error, the accident, the interference, and makes them available for exploitation. The (application) design process that is implied in Max/MSP/Jitter tends to be attractive to non-programmers and to some extent forces a visualisation of decision-making processes and erratic connectivity. The clusters of boxes and

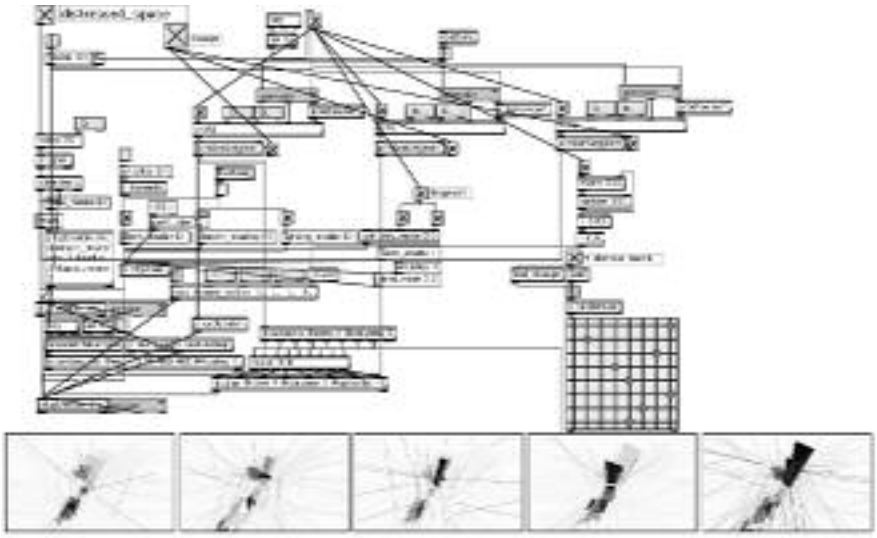

Figure 1: The Max/Jitter authoring environment.

connecting lines effectively represent a kind of multi-dimensional flow diagram that underlies the computational process. One of the central aspects of Jitter is the fact that all data structures are represented as configurable matrixes of specified data types, dimensions and sizes. A great part of Jitter's possibilities in the realm of processing and mapping relies precisely on this fundamental entity. The values of a pixel array on a screen of 400 by 400 would take the form of a 4 dimensional (RGBA) integer, 400 by 400 matrix. Figure 1 shows an environment with which the designer interacts by connecting/disconnecting, re-configuring in a time-dependent way, and experimenting while examining the visual or kinaesthetic result.

Conclusive Distress

Intervening in distressed space, through the use of time-based tools implicates the designer in the disjunct condition between the familiar and the non-familiar, the smooth and the distressed. The play with geometrical parameters in the context of time suggests a modes for interfering in space; in a way that extends how time-based distresses are exploited in cinema, music and performance art. The architectural design distress does not provide a formula for building but introduces experimentation in disruption which is commonly left behind in computer aided design. The ideals of "smart architecture" and tangible computing, in blending and merging, can be distressed by resistance — an architecture that does not only facilitate but fights and provokes in an articulation of space by event (Tschumi, 1994). The distressing due to time-based computer media provokes the design of events rather than forms — events that are a step removed from a final "product." The space (distance) between the program and the architecture is in itself a discontinuous and disrupted one.

A weave always weaves in several directions, several meanings and beyond meaning. A network-stratagem, and thus a singular device. Which? A dissociated series of 'points', red points, constitutes the grid, spacing a multiplicity of matrices of generative cells whose transformations will never let themselves be calmed, stabilized, installed, identified in a continuum. Divisible themselves, these cells also point towards instants of rupture, discontinuity, disjunction. (Derrida, 1997 p. 332)

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