

# *Representation, Generation and Emancipation in Virtual Landscapes*

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## INTRODUCTION

CONTEMPORARY LANDSCAPE ARCHITECTURAL theorists, such as James Corner, Peter Connolly and Beth Meyer, often predicate their discussions on landscape representation by emphasising the peculiar distance that landscape architects have from the media of landscape itself. (Corner 1992, Connolly 2002, Meyer 1999.) Landscape architects make drawings, and these drawings or representations are an intermediary and translatory medium to the eventual design of the physical landscape. Quite often the experiential, ephemeral and tactile qualities of the landscape are ignored in these drawings. Computer representation techniques often magnify this distance from the landscape and its sensual qualities. Our students often immerse themselves in front of their computer screens and the studio project site is reduced to a Computer Aided Design (CAD) plan. However, computers can also liberate students' designs and enable them to fold conceptual and spatial environments into unexpected speculations.

A central aim of the Silicon Luddite studio was to liberate students from conventional landscape representation techniques. We wanted to use computers and Virtual Reality Modelling Language (VRML) as simultaneous, speculative and demonstrative representational devices. The VRML allowed students an interesting alternative for the simulation of landscape environments and was useful as a means of exploring design propositions beyond two-dimensional images. The studio also positioned representation as a generative, form-giving device. We encouraged students to make use of unexpected modelling 'mistakes' as explorations of form. While digital media is often utilised as a generative and/or representation device, the students' conclusions begin to question the significance and design of virtual space in landscape architecture. This paper also highlights how the utilisation of VRML and the Internet can modify studio teaching agendas. One of the educational aims of this studio was to offer a critique of RMIT's standardised, template approach to teaching with the World Wide Web. We also delved into mixed modes of delivery and remote critiques. Finally, this paper asserts, through a studio case study, that design is an act of research that can offer outcomes beyond technical and teaching methodologies. (Glanville, 1998.)

## STUDIO METHODOLOGY

The Silicon Luddite studio operated over 14 weeks, and included both technical and theoretical design workshops. Fifteen students explored and tested their design

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## KEY WORDS

*Representation  
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## REFLECTION

work in virtual space using an array of current software available in the RMIT Faculty and commonly available computer hardware. 3D Studio Max and AutoCAD were used as a primary tool to develop models for real-time, walk-through critiques. The models were transformed into VRML (code) and further revised and refined. In some instances, VRML became generative as well as experiential ... as is often the case with new media. (Lynn, 1997.) The role of critique was also central to the studio's design process. Thus, in addition to RMIT's standard of two intensive public critiques (mid-semester and final semester), and our weekly one-on-one desk critiques, the students engaged in fortnightly one-on-one desk critiques over the Internet with outside academics, and peer critiques, both in person and over the Internet. Email and, later in the semester, the dialogue boxes from the avatar discussions were also a central form of debate and critical feedback about the students' design propositions.

The first six weeks of the studio programme were dedicated to the production and conversion into VRML of a previous semester's design studio project. The students were also required to provide access to and an explanation of their models through the Internet. They developed multiple process models and posted them on their websites for open discussion and debate. Many techniques were required to achieve the desired result within our hardware limitations. Landscape and terrain modelling is rarely used at RMIT; this studio provided a foundation to landscape students in some advanced and powerful techniques. 3D Studio Max also served as a highly visual assembling tool through the application of textural representation, and general scene development in the virtual models. Students became fluent with a palette of modelling packages, including the direct editing of the source pages of simple programming code in VRML.

The next four weeks were focused on developing a critique of the designs through the modelling medium. The designs had to communicate through a set of intelligences and compromises. We set a five megabyte memory limit, in order to make sure the models were completely operational over the web. Students responded, and redesigned their proposals based upon the comments from remote and local critics. Intensive reworking and remodelling was necessary. The students developed a fluency in this period that enabled them to overhaul their models completely in a very short period of time. The final four weeks allowed for refining designs and customising the models to run as efficiently and effectively as possible on the limited capabilities of the presentation computers, as well as developing website presentations. We also implemented some experimental software to enable multiple critics to be present as avatars and to communicate with each other inside the same design world.

## RESULTS AND DISCUSSION

The following discussion of student work solidifies key issues and constraints within the studio. It offers specific examples that are aimed at outlining the significant conclusions in this paper. Three themes emerged through the students'

projects: 1) invention or experimentation with representation as a more experiential, ephemeral media; 2) representation as a form generator and, 3) the possibility of virtual landscapes as an alternative media. Josh McDougall's and Aaron Stowe's work exemplifies experimentation with the VRML technique to enhance a spatial understanding of their design propositions. Darren Roach's project is an interesting example of both form generation through VRML, and website communication to a diverse constituency of skate park users. Jesse Sago and Susie MacFarlane address landscape as a virtual medium and the potential for exploring virtual landscapes as an end product, rather than as a model or representational strategy that attempts to simulate the real landscape. Overall, this paper and the studio recognised that environmental and economic pressure continues to cause landscape architects to rethink the way in which we design. The students' projects seriously questioned the rationale for designing new landscapes, especially those with unsustainable outcomes. Leon van Schaik stresses this in an architectural context when he discusses Hani Rashid's virtual Stock Exchange, "The institutional need for such (real) buildings is very limited, and will become more limited in time, as demographics dictate. The institutional need for these virtual environments is just beginning to emerge". (van Schaik, 2001.) The following discussion of student work highlights the need for landscape architects to reconsider our design techniques as well as our design outcomes.

Josh McDougall's project was a critique of the traditional representation techniques employed in the design of terrain in landscape architecture. Students often struggle with the contour mappings and sectional devices that conventionally describe topographic relationships. Josh's project explored the possibilities of experiential terrain modelling through VRML with the hope that it may overcome some of the shortcomings of the other forms of terrain representation.

The site utilised for the project was the Federation Square site, known previously as the Jolimont Rail Yards in Melbourne. It is on the South edge of Melbourne's Central Business District (CBD) and extends from Flinders Street Station to Melbourne Park. An inherent quality of the site is its vistas to and from the city, to the botanical gardens and the sporting precincts. Josh investigated initially a number of quarries and construction sites. His design outcome folded the qualities of form, material and scale that he found in the quarries into the contextual, visual relationship of the site. Josh proposed a large shifting earthwork, which would reveal and extend the significant views within the site - a post-modern picturesque strategy. As the city skyline and the context shifts adjacent to the site, the mounds would shift to emphasise this continual flux. The topography is shifted continually to respond to its context, and the design is an open-ended process. (See Figures 1 and 2.)

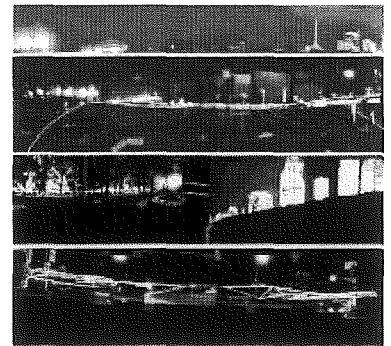


Figure 1: Josh McDougall's Homepage with experiments in representing landscape topography.

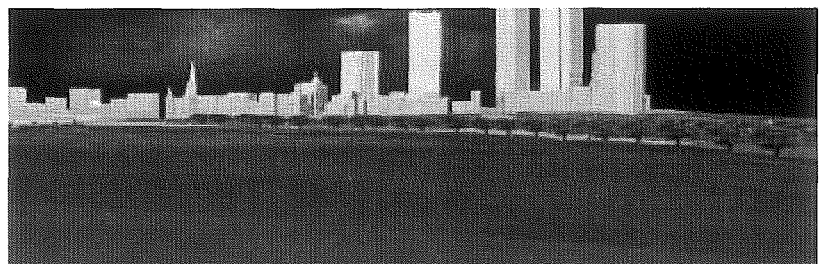


Figure 2: Federation Square site Melbourne, Victoria, Australia.

Modelling the terrain for large mounds of dirt proved to be an overwhelming task. The technology and software available for terrain modelling at a very precise scale is only geared towards engineers, and is very difficult to decipher. However, Josh managed to create a complex system of polygon shapes, which linked together to describe his earthwork.

Josh's VRML world proved to be quite interesting. The model allowed us to walk through the site and see how the terrain manipulated the views inwardly and towards the context. In addition, the terrain surface texture could be removed (turned off) to expose the polygon structure. This allowed the viewer to experience the magnitude and subtlety of the earthworks by comparing it directly with the existing grade. Thus, Josh utilised the technology to create a unique representational system than can describe topography, topographic changes and soil erosion processes. Josh's model allowed the viewer to walk literally over and through the undulating terrain, compare his proposed changes to the site's existing form, and balance the results of shifting the mounds of dirt across the site. The model is continually updated to reflect changes in the city fabric and the shifting of the mounds. (See Figures 3 and 4.) Traditional representational devices often struggle with time and process that are integral to landscape; Josh has developed a technique that explores both simultaneously. His model also allowed for the design proposition to remain open ended. James Corner stresses the need for this type of representation when he discusses the importance of displaying the invisible aspects of landscape, supplanting how it looks with knowledge of how it works as a physical, cultural and unfinished process. (Corner, 1992.)

Aaron Stowe's project further tested visual properties of VRML and provided an additional critique to traditional landscape representation devices. Although Aaron had previously constructed two traditional models, they did not allow for the spatial qualities of the design or the material textures to be read. His plans and collages communicated the design's intentions and ideas, but not its scale. The traditional mediums proved to be too static and magnified the need for representation tools that allow for a plan-generated design to be tested simultaneously in a spatial manner. Three-dimensional AutoCAD drawings allow comparisons between plan and model but they do not allow us to navigate through the model. The spatiality of the proposition is only experienced through static, captured views. In addition to representation techniques, VRML enabled Aaron to engage in a deliberate process of design and redesign, testing and retesting form, examination of textures and materials, and challenging the initial design's programme. Aaron was able to generate, assess and alter his models continually. This enabled him to attempt to achieve a *hyper realistic design* in which he hoped to communicate clearly the 'actual' through a 'virtual' representation technique. Aaron stated, "I have made a deliberate choice to represent the final design model in a 'near-to-reality' manner as possible ... I wanted to explore: How real is VRML? What are the boundaries and limitations of VRML? And does near-to-real communicate design better or just differently?"

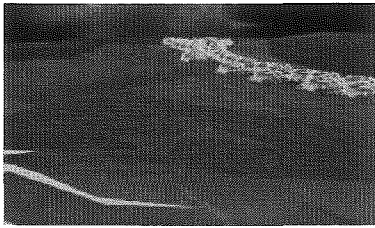


Figure 3: Josh McDougall's terrain with surface turned off.

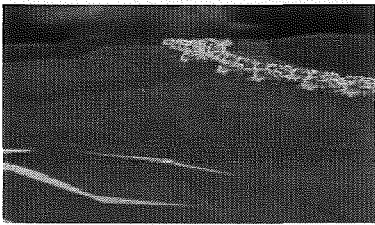


Figure 4: Josh McDougall's terrain with surface turned on.

The project site is on the current Enterprise Landing site on the edge of Melbourne's CBD and the Yarra River. The initial design involved a memorial honouring the Stolen Generation, which was generated from ideas about devastation. Aaron literally projected a shattered pattern onto the ground surface of the site. The pattern can be read from the overhead train lines, and it transforms from the ground plane. Aaron altered the initial design form by generating a series of virtual reality models that utilised the shattered pattern beyond the initial site into a broad urban context. This resulted in an exploded form with strategically located shards along the adjacent roads, on Flinders Street, into the Yarra River and symbolically splintering the wharf. The new design form led to a rethinking of the programme and a subsequent redefining of the shards. The shards, which exploded outside of the site, became street furniture, such as benches, tram stops and shelters. (See Figures 5, 6, and 7.)

Aaron used his website as a connection to the wide-ranging national debate, which informed his ideas about the Stolen Generation. He invited comments and discussions about the social context of this issue as a whole while, at the same time, encouraging comment on his design proposition. He also documented the constant exchange between AutoCAD, 3D Studio Max and VRML, and his progress, as part of his webpage discussion of his design. The visual record of how the forms evolved and transformed was exceedingly useful to remote critics and those interested in his design process. Students and designers often present their work in 'final' form, thus leaving out the significant influences that helped to alter their design decisions. The webpage media provided an easy way of recording and reflecting upon these processes. The virtual reality model also allowed the design to be experienced in a variety of modes; we could walk through the site, ride the train and look over the site, or view it from above as if we were situated in an adjacent office building. Aaron's generative process enabled him to go beyond the initial physical boundaries of the site and to consider a design proposition that commented on the broad urban and social context.

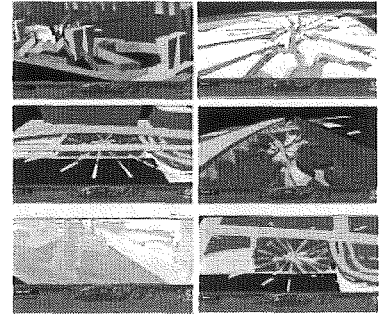


Figure 5: Aaron Stowe's multiple design models.

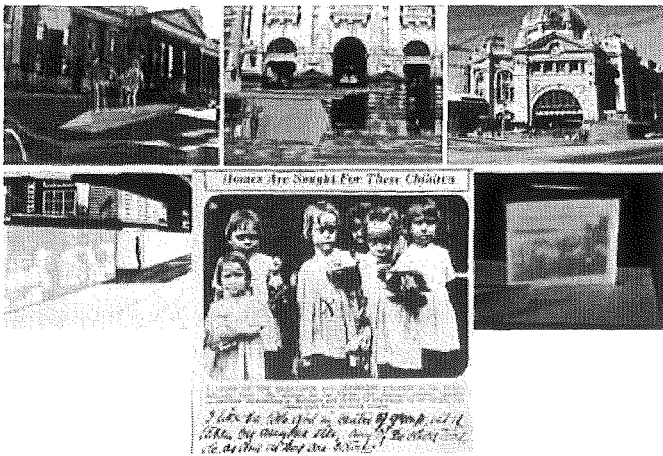


Figure 6: Aaron Stowe's earlier work exploring memorials invading the city fabric.

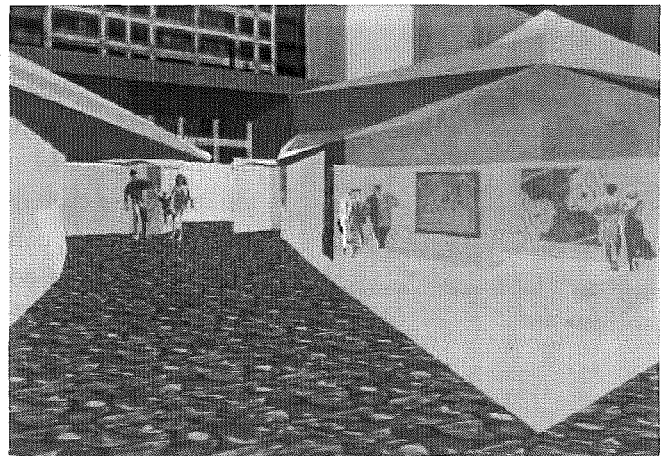


Figure 7: Walking within Aaron Stowe's final model.

Landscape architects often struggle to generate form beyond the strategic and aesthetic placement of programmatic elements. Darren Roach used virtual reality modelling as a form-generating device as well as an exploration of 'sk8te' culture (skate boarding, roller-blading, and so on). Darren was particularly interested in how a technology, which removes or alters personal interaction with the actual normative experience, could inform the design of a skate park. And then, perhaps, enhance our experience by offering a layering of information or links to other skate-able sites, styles, sub-cultural insights and so on. The site for Darren's project is located on the Queen Victoria Hospital site in the Melbourne CBD. It is located between La Trobe and Russel Streets on Swanston Walk, well within the heart of the city's commercial shopping and tourist district. The design critiques the standard approach to designed skate parks, in that they are a collection of objects or obstacles which skaters, through various methods, appropriate. However, sk8te culture finds these places drab and relatively unchallenging, which perpetuates the continual act of colonising other skate-able spaces within the CBD.

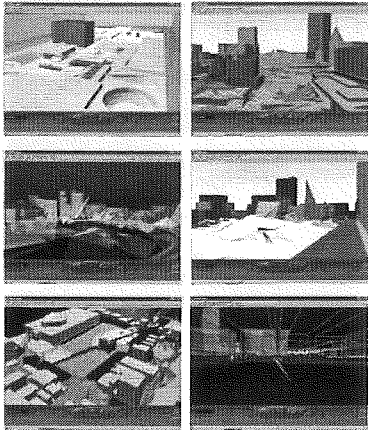


Figure 8: Darren Roach's early skating terrain models.

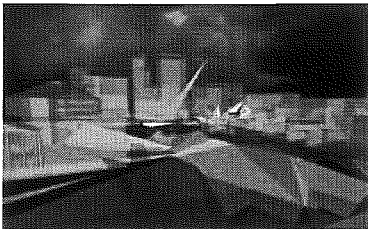


Figure 9: Darren Roach's final model.

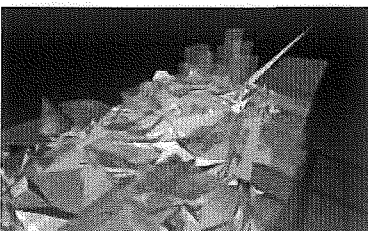


Figure 10: 'Sk8te' Terrain via modelling as surface generator.

The virtual reality model of Darren's work started off with a series of terrain explorations. Once he perfected the terrain that he initially sought to utilise, Darren discovered that some of his terrain *mistakes* made for more interesting skate sites. The constant ability to reshape and reorganise spaces totally and very quickly allowed Darren to generate and test multiple terrain models. Thus, VRML became a generative device and Darren became less worried about his initial design form because he was able to alter his ideas quite fluidly. In addition, Darren's webpage allowed the sub-culture to share knowledge; tricks and tips, good sites to do the 'perfect grind' and so on. The website also provided a forum for soapboxing opinions or protests related or unrelated to the sk8ting sub-culture, all with effects occurring in the real world. It offered a form of community participation and connection to an often marginalised group of people, through a media with which they were comfortable engaging. However, the limitations of the media are the very rationale behind skating. It is the thrill or rush of pulling off the perfect jump, which is still unable to be reproduced. The bodily feelings and the pain of failure cannot be simulated. Virtual reality can attempt, through the aid of animations and animated cameras, to reproduce movements and kinaesthetic experiences visually. According to Darren, "The sense of time slowing, floating, and speed is easily replicated in VR models as well as to the morphing of the mundane curb into the best curb I've ever sk8ted on!" This project discovers and attempts to communicate how sk8ters view the world and what are they seeing that others do not. (See Figures 8, 9, and 10.)

Jesse Sago's and Susie MacFarlane's projects pushed virtual reality modelling past a generative device or representational strategy into a more conceptual dialogue about design and its intentions. Both students assert that the act of designing a virtual world is in fact just as valid as designing the physically built space. While Jesse's project - entitled 'Virtual Cemetery' - asserts, ultimately, that the need

for cemeteries can be met through virtual means rather than physical spaces, Susie's project declares that the text used to describe modelling language is essentially what informs architectural space. They question the need for normative design outcomes (meaning physical spaces) when the possibility of virtual space seems rather unlimited. Recent curricula development at RMIT, and in most design schools, supports a move to include digital environments as an alternative form of practice. Greg Lynn, an architect who has pioneered spatial information architecture, goes a bit further in his critique of the necessity to make physical buildings. Lynn asserts that classical models of pure, static, essential and timeless form and structure are no longer adequate to describe the contemporary city and the activities that city supports. He argues that it is technically and culturally inevitable that computer technology will facilitate new architectural spaces and fields and, in many cases, architecture will be made fully redundant by virtual spaces. (Lynn, 1996.)

Jesse's early modelling investigations revealed the 'horror' of what he had originally designed in the cemetery studio. However, his initial design ideas were invested in the equity of death. He wanted to remove the history of Australian cemeteries with regard to religious and racial segregation. He also critiqued traditional cemeteries for excessive land requirements and environmentally degrading outcomes. Through further investigation, he found that the majority of grave sites and internment walls are under maintained and not visited after the first year of death. He proposed that cemeteries should become virtual. Virtual memorials already exist, enabling a diversity of 'grave' types and styles, and virtual cemeteries could be a collection of these sites. Jesse argued that any cemetery form, grave marker, urn, and so on could be accommodated in a virtual space. He also felt that a virtual cemetery would not reach capacity as soon as the conventional space. Obviously, there are both culturally and socially significant issues to this idea, which this design investigation begins to query. However, Jesse asked a fundamental question about normative practices in society and challenged the way in which designers propose solutions. (See Figures 11 and 12.)

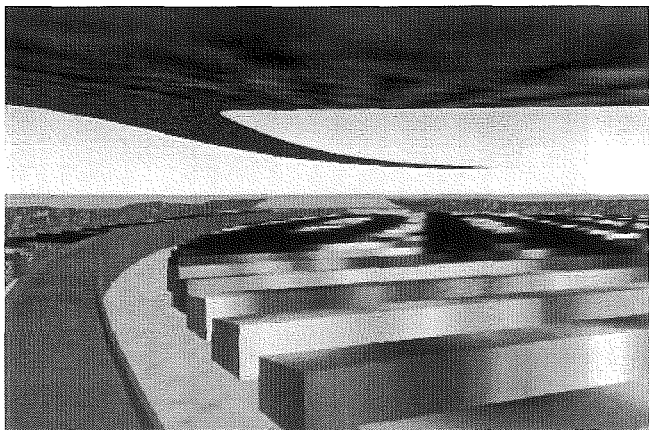


Figure 11: Jesse Sago's virtual cemetery.

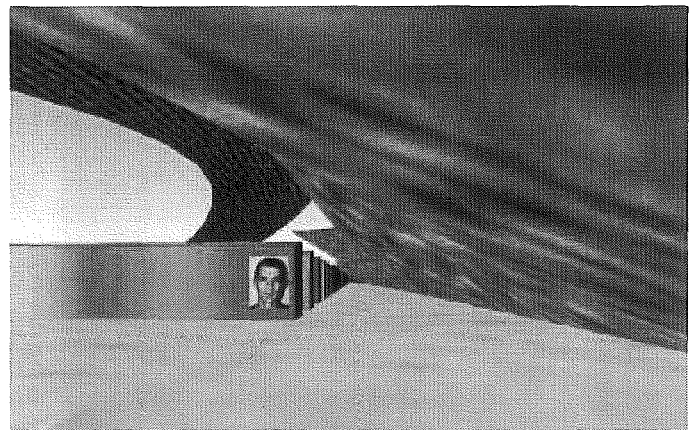


Figure 12: Walking through a virtual repository for memories of the deceased.

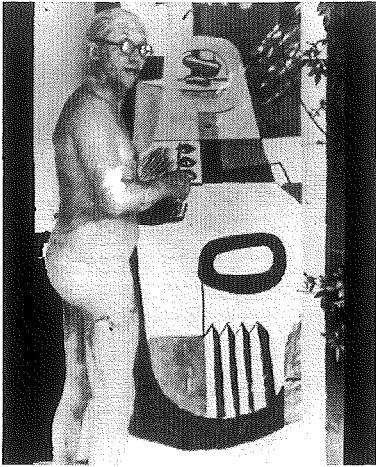


Figure 13: Pop up webpage accessed through model.

Susie MacFarlane's project, *Real Life 2.0*, posed the question "what do we want (to see)?" She was interested in exploring architecture as both a sensual experience of space and a thing of the mind; a dematerialised conceptual discipline. Her investigations started with a proposed surf lifesaving club on the Middle Park beach. Initial models failed to situate the work within its conceptual dialogue; a space for seeing and a space for being seen. The VRML uses a code-based language to describe complex polygons and their spatial relationships. Behind the flash of the models are many lines of text that build the virtual world. Susie's world explored text as literal architecture, as it informed the model, and as it linked to a conversation she had through the web links. In order to unravel her thinking and the conceptual development of her work, we must travel through her textually enriched model and stumble upon links that contain clues. This work also questions the visual seduction (scopophilia) of virtual worlds, the web, and design representation in general. (See Figures 13, 14, and 15.)

## CONCLUSIONS

Digital media, such as VRML, offer both pragmatic and conceptual outcomes. For instance, the immediacy of a product or mock-up model allows designers to make minor or major changes, insertions or subtractions, and produce comparative models to illustrate differences in a relatively short period of time. Further, the ability to 'walk-through' a design using a scaled avatar facilitates a sense of freedom to roam throughout the VRML world, enabling an immersive quality in the design representation. (See Figure 16.) Virtual reality models offer multiple views or strategic views from above, below or inside, while suspending gravity to change the pace of movement to simulate different modalities of viewing (that is, walking, skating, or a drive-by in a car). Designers can choose to work with conceptual models or 'near-to-reality' models that test textures and material qualities throughout a design, and at multiple scales. They can utilise a web-based presentation format that allows the viewer numerous levels of engagement with the design project. As a studio proposition, virtual reality modelling offered multiple methods of providing feedback about design ideas that included: remote



Figure 14: Susie MacFarlane's text model.

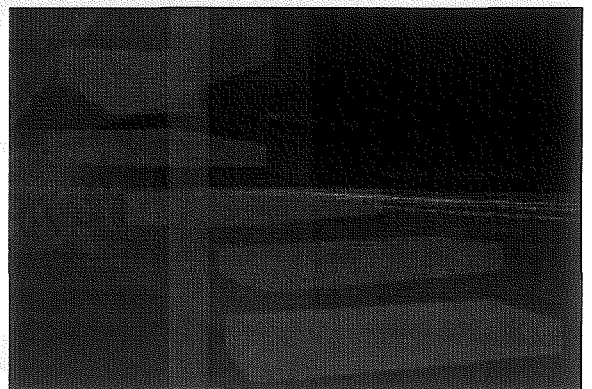


Figure 15: Detail of text model and portal to discussion webpage.



online critiques, peer critiques (any time/any place), projected 1:1 scaled immersive presentations (similar to IMAX) and desktop critiques.

The Silicon Luddite studio began by exploring the potential of virtual technologies to enhance representation strategies and spatial inquiries through the use of digital media. We were also interested in a digital language pertinent to landscape architecture, and in a sense of inquiry or critique that can be both collaborative and remote. Fundamentally, the student projects question the actual medium of 'landscape' in landscape architectural design.

While much of the work struggled with landscape representation, a critical body explored the potential of virtual environments as landscape design. The Virtual Reality Modelling Language allowed the students new insights into simulating landscape environments and, therefore, shifted the focus of the studio away from landscape representation into virtual landscape production. We began to take seriously the value of virtual environments in addition to colloquial, real environments. The immersive qualities of virtual environments speculate on experiential realms in a digital fashion. The peculiar distance between the landscape architect and their medium was dissolved. As the profession of landscape architecture considers alternative futures, virtual environments will provide an essential, new field of exploration. Currently, what we dismiss casually as *Gameboy fodder* may, perhaps, be the most ecologically sound, socially conscious, landscapes of the future.

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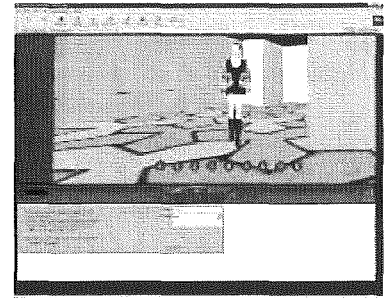


Figure 16: Scaled avatar in VRML model