Space, Agency, Meaning and Drama in Navigable Real-Time Virtual Environments

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ABSTRACT
Does our preoccupation with navigable space distract us from the expressive potential of interactive media? Can our understanding of spatial context in virtual environments (VEs) be expanded to incorporate social reasoning and behavior?

Drawing on the theoretical foundations and practice of Architecture, this paper considers the relationship between person and environment in the real world and in navigable real-time three-dimensional digital worlds. The first part discusses the cyclical and bi-directional nature of the person _ environment relationship with interactive involvement as the basis for meaning construction and behavior guidance. The second part considers the differences brought in by the representative nature of computer-based interactive three-dimensional (3D) worlds. The examples for discussion are derived from the rich field of videogames. This is followed by an overview of the principal components of *Shenmue II*, a role-playing game, and a case-study examination of one interactive sequence from it. The analysis shows that navigable space always carries meaning, reiterates that interactivity is an integral part of spatial experiences and illustrates how construction of mental images is a product of mediation. When VEs are designed to utilize rich agency and expressive mediation devices, they potently overstep the systematic rule-based constraints of their design and become meaningful and engaging as situations that have real-world roots and dramatically significant consequences.

INTRODUCTION

This paper is concerned with interactive navigable real-time (RT) 3D VEs. Current (summer 2003) 3D games exhibit increasing levels of sophistication in the construction of complex coherent worlds and thus provide valuable material for analysis. We hope the theoretical perspective and practical techniques discussed below have a general value that extends beyond the narrow boundaries of the genre and implementation specific to our examples.

Oliver [18] has suggested that the expressive intensity of RPGs is in their progression-like structure, where earning the right of way is a constant necessity. The game system's resources are focused towards the player avatar and the avatar's path through the game-world. The game produces and

organizes objects, rules, events and rewards in order to manage and diversify the player's experience of progress. To that end, the system is able to assign immediate, personal value and significance to intrinsically abstract objects (e.g. interface-level metaphors such as health packs) overcoming the player's preconceptions of them that are often carried over from other game titles in the form of universally understood rule conventions. These objects are indeed more than metaphoric representations. But they are not just parts of the system either. VEs are designed for people who have bodies and whose cognition is conditioned by being in spatial worlds. VEs are approached and interpreted on the basis of knowledge and experience that is external to the system but is enabled by the system's support for the 'structure of involvements' that is characteristic of our situational world. This idea is born out of an understanding that all objects and events in our world are interconnected and depend on each other for their existence (i.e. in our conscious, a table implies a floor and so on). We suggest that this hybrid nature of VEs that mixes the situational and the systematic is an important source of their significance and appeal.

The expressive power of VEs lies in the unique way in which they generate 'suspension of disbelief' – the basis for their capacity to intrigue, provoke, touch, educate or entertain. Chris Crawford [7] insists that interactivity is the single competitive advantage of computers in general and videogames in particular. We suggest that interactivity (or agency) is at once the primary point of interest and the agent that makes, holds together and gives access to places of our lives. Interactivity is not only a discrete-step dialogical exchange of 'listen, think, speak' type – in complex dynamic spatial worlds interactivity simultaneously works at several intersecting levels, mixing systematic and situational orders. This capacity gives the expressive means to explore the notion of 'dwelling' and a host of related universally-interesting space-bound issues.

PERSON _ ENVIRONMENT RELATIONSHIP IN THE REAL WORLD

Our environment is a dynamic socio-physical conglomerate, holistic and irreducible to its components. Our image in the eyes of others, along with the way we are situated in society are among the dominant influences on our behavior. Socio-physical settings and behavior become tied together into congruent and recognizable wholes (a phenomenon that was described from a physiological perspective by Barker [2] as synomorphy and from the architectural point of view by Alexander [1] as pattern language): e.g. we do not smoke in a church or dance in a court room. Spatial environments are adopted or remodeled to accommodate human needs – from the basic such as hunger, sex and avoidance of fear, to the communicative such as privacy and community, ritual display and surveillance, and also, to the emotional such as stimulation, security and identity. These needs arise in time and are satisfied in space according to their peculiar rhythmical and/or hierarchical patterns that have an impact on the composition of the environment (and its design). The simplest building or cell consists of a boundary, a space outside the boundary, an entrance and a space within the boundary all placed in a larger space surrounding them. Even these simple elements have sociological references: the space within the boundary is associated with an inhabitant; the boundary is a control structure and an element that defines the inside; the outside is the domain of strangers; the space immediately outside constitutes the interface between strangers and inhabitants; and the entrance serves as a means of converting a stranger into a visitor [10][11]. We depend on the capacity of space

to form identifiable places appropriate for certain kinds of behavior. These places – an amalgamation of activities, physical form, and conceptions – manifest and structure our being-in-the-world and our relationships with other people.

Understanding and behavior in an actively responsive world do not arise as a simple outcome of an addition of person to environment; rather, the two are said to exist in the state of interaction. We have to act to be able to reliably perceive and understand our environment. Bodily movement and navigation through space are necessary in order to comprehend spatial layout and eliminate perceptual illusions.

The importance of active involvement with the environment extends beyond basic cognitive processes. Environments, either natural or built, carry complex sets of redundant affordances that have the capacity to accommodate a variety of behavior patterns. Our pattern of behavior, cued by our perception of particular sets of affordances, depends on our current goals and the set of constraints (such as time, general knowledge and previous experience) on our potential actions. That is why most of our activities happen in space and are unsustainable or even unimaginable without their associated places.

The aspiration to understand and use in practice the behavioral implications of the person-environment relationships originated in the 1920s with the initial interest expressed primarily by architects (see Pol [19] for a historical survey). The field is truly multi-disciplinary with contributions from and applications in philosophy, geography, sociology, psychology and architecture. A unifying and definitive theory does not exist, and the dominant view is that the existence of a range of complimentary approaches is beneficial to such a complex and historically mobile set of issues.

Despite this lack of one definitive theory, it is possible to outline a broad consensus compliant with the theoretical and applied efforts to date. The environment and the person are tied together by a flux of bi-directional transactions (see Burroughs [5] and Gifford [9] for foundational statements on environmental psychology) that can be seen as an elaboration of Lewin's [14] fundamental equation:

$$\mathbf{B} = f(\mathbf{P}, \mathbf{E})$$

Where **B** is behavior, **P** is the person and **E** is the environment.

Current understanding of environmental perception is inclusive of both 'bottom-up' (the information is in the environment) and 'top-down' (the interpretation is shaped by experience) theoretical standpoints. The process appears to have a cyclical nature: we use the environmental information to build up a perceptual model and then rely on this model in search of expected features (after Neisser [16]). Our experiences unfold in time and we are constantly predicting what is going to happen next, whether with music (temporal), architecture (spatio-temporal), or anything else. Without this predictive process, we simply could not cope with the amount of environmental information that is thrown at us by the world.
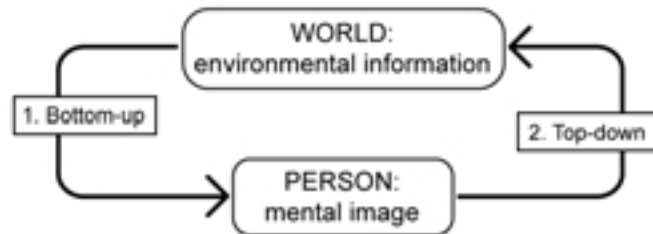
Image 1: **1.** The environmental information is processed and accumulated into a mental image. **2.** The mental image structures expectations and the search for affordances.

In his discussion of the theoretical basis of environmental psychology Cassidy [6] (p.23) has quoted Ittelson [12] who says that 'the environment we know is the product, not the cause of perception'. Cassidy further states that 'the outcome of the transaction between person and environment is the production of a phenomic environment which is ultimately unique to the individual. […] The fact that a perceptual image is at least partially the product of an individual's experience suggests that individuals whose experiences differ markedly will have different perceptual images of the same physical environment'. Any consistencies over time in a person's behavior can be partially attributed to the similarities of situations (the environment factor) and partially to an enduring mental image of the world (the individual factor).

We can conclude by saying that the relationship between person and environment is the state of interactive exchange, that the environments we know are phenomic constructions and that these constructions differ between individuals. VEs redefine the nature of **P _ E** interaction as well as the way mental images are constructed and used. We shall have a look at the similarities, differences and possibilities for control and expression in the next chapter.

PERSON _ ENVIRONMENT RELATIONSHIP IN VEs
The differences between the real and virtual environments have been discussed at length in academic and professional settings. In VEs the structural integrity of the buildings does not need to comply with non-existent or selectively implemented Newtonian laws; similarly, protection from the elements is not an essential concern. Since its early days, the virtual reality (VR) community has been excited about seemingly unlimited compositional freedom in design of VEs. However, navigable VEs are not abstract constructs. They exist to be perceived, interpreted and appropriated by humans. As such, they are bound by the physical and mental capacities of their users, i.e. by innate and acquired perceptual abilities, personal characteristics, needs and motivations.

In order to compare **P _ E** relationship in the real world to that in VEs, we shall use a navigable RT 3D role-playing game (RPG) as an example for analysis. *Shenmue II* [20] is an RPG/adventure title that exhibits motivating aspirations towards expressive and rich game-world creation. Fencott [8] has discussed *Shenmue* in terms of narrative potential and perceptual opportunities. His analysis sees the game as a predominantly systematic construction. The approach presented here is not without similarities but, instead, focuses on the

environment rather than narrative and aims to add to the discourse by stressing the situational roots of VEs. We shall confine the discussion to one characteristic case to exemplify the general approach.

RPGs, like *Shenmue II*, attempt to control the player's behavior and interaction with the environment. Players' access to the game world is accomplished via an association with an avatar with a distinct character, history, age, nationality, knowledge, and long-term goals. These individual characteristics influence the way in which an environment is both seen and dealt with. Even if the player is determined to stay in-role, there is an important misalignment between the mental state and personality of the player and the fictional personality of the protagonist. This is in addition to a layer of mediation that is separating the player from the underlying data structures. Game-design can adopt various tactics that deal with this misalignment and therein lie the potentially powerful sources of dramatic expression.

The cyclical model of **P _ E** interaction needs to be modified to reflect two extra layers of complexity that are characteristic for RPG games like *Shenmue II*. The cycles can be represented as two nested loops; each loop incorporates a step where mediated presentation provides access for authorial control that can be used for dramatic or narrative purposes.
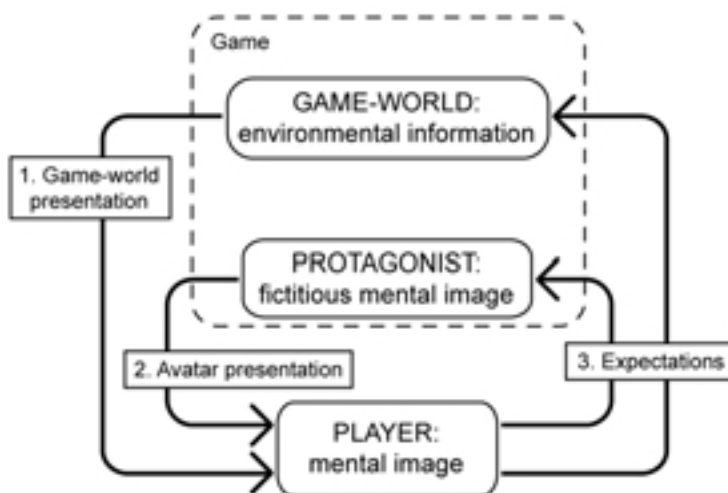

Image 2: **1.** The game uses mediation devices to present the world; the player processes the presented information and accumulates it into his/her mental image. **2.** The game system interprets and presents the protagonist as an entity with a distinct character and attitude towards the game-world. **3.** The player's mental image, incorporating a phenomic model of the game-world and the protagonist, influences expectations and thus structures perception and behavior.

Let us consider the members of the **P _ E** cycle in greater detail.

Game-World

The game-world (or any other VE) is a complex symbiosis of systematic and situational orders (see more on this in Roudavski, 2003[1]). On one hand, a game can be seen as an internally coherent system that can be defined by an initial state with a fixed selection of recourses, a hierarchy of goals or success-states, and a structure of rules and processes that define a path from one state to another. Understood in this way, the game-world is seen as a hermetic machine with abstract components that derive their meaning only from the system itself. However, ultimately, even the most abstract games such as chess are situated as members of informal domains.

Chess can be described in symbols, this description can be analyzed, and the outcome determined with guaranteed correctness. However, let us have a look, say, at the curious article 12.5 of *Fédération Internationale des Echecs* (FIDE) official Laws of Chess.[2] It states that '[i]t is forbidden to distract or annoy the opponent in any manner whatsoever. This includes unreasonable claims or offers of a draw.' FIDE cannot possibly predict all the possible causes of annoyance (as annoyance arises from idiosyncrasy). The existence of this rule highlights that chess is more than a hermetic game-system; rather, the game-system constitutes an integral part of a competitive situation. Hence, the method for working with informal domains is similar to the cycle of the perceptual loop: make a set of statements or rules about a situation, find an anomaly, recognize a consideration that was ignored and repeat. Rather than vagueness, informality can be seen as unbounded relevance: there is always something else to be considered.[3] In the real (situational) world, things are interconnected by an inseparable mesh of claims and counter-claims.

As we have been arguing elsewhere [17], a navigable interactive VE necessarily relates to knowledge and experience that is external to the system. The cultural and experiential links to the real world serve as an essential source of meaning and emotional engagement. These connections do not disappear if ignored by the designer but become sources of misinformation and confusion. When incorporated into the system-mechanics and supported by agency, they become an invaluable resource for meaning-construction, place-making, characterization and drama.

In *Shenmue II*, the system incorporates a consistent dynamic game-world that features spatial environments and non-player characters (NPCs) as well as player-progress management routines including time, money and communication structures. Functioning as an intricately balanced structure of game-mechanics, this world derives much of its meaning from a fictional, narrative base that provides an overarching storyline and, perhaps more importantly, situates the game-world in relation to known geographies and cultures – thus creating a web of associations and expectations. The fictional

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[1] Roudavski, S., Spatial Context of Interactivity, in *Proceedings of Interactive Convergence Conference*, Prague, 7-9 August 2003 (to be published); download from http://www.stanislavroudavski.net (as of 29 August, 2003)

[2] http://www.fide.com/official/handbook.asp (as of 20 August, 2003)

[3] Cf. Prof. Michael Jackson's keynote speech at Soft-Ware 2002 Conference: Formalism and Informality in Software Development, http://www.infc.ulst.ac.uk/informatics/events/soft-ware/ (as of 20 August, 2003)

base is static in *Shenmue II* and the player discovers its meaningful elements as the game progresses. The decision to utilize a fixed-consequence pre-written story in the game-world (as well as how to use it) is at the discretion of the designers. The story can be strongly integrated with the system mechanics via reliance on some kind of virtual storytelling procedure (e.g Façade, [15]). Alternatively, the fictional cosmology can be kept at the background while player-progress is encouraged by other means (such as the structure of rewards and social engagements seen in Massive Multi-Player RPGs). However the narrative is used in a particular game, the fictional base remains an important source of factual and symbolic material that is used to define the hero's role and the game-world in relationship to the external world and culture.

Environments
Real-life environments are dynamic rather than static. Built environments emerge and change over time as conglomerations of practical responses to existent social patterns (usual for vernacular architecture) or as predictions (in the case of designed artifacts). In all cases, the process of occupation brings along constant modifications with certain parts of the buildings changing at a different rate from the others (see Brand [4] on the way buildings learn). These modifications are usually driven by common-sense needs and are reflected and made more legible through their visual form.

The world of *Shenmue II* is organized as a structure of spatial settings. In terms of permeability, the space within each area is very shallow: most of navigation occurs in undivided carrier space (see Hillier [10] for a discussion of these concepts) with most of the other spaces directly accessible from it. This structure often resembles a corridor and is a common choice for game-worlds because it provides a controlled environment with which to direct player-progress. Within such a structure, navigational freedom is severely limited as movement is only possible along a predetermined route. The presence of fictional base implies history, culture and social practices that are representations, interpretations or reenactments of real-world phenomena. The use of one-dimensional corridor-like structure, therefore, eliminates some of the benefits of having a fictional base as the player's understanding and navigation of the environment on the basis of real-world knowledge becomes fettered. The links to the cultural setting become superfluous and restricted to things like shop signs and other glue-on decorative elements. Such structures limit the capacities of VEs to exploit or express socially and culturally conditioned behavior – which, arguably, would be deeply suggestive and open to creative interpretation by an active player – and, consequently, create places that are architecturally incongruous and limiting in terms of affordances: their perceived potential for action.

Shenmue II consists of four distinct environments: *Aberdeen*, *Wan Chai*, *Kowloon* and *Guilain*. Each includes several areas that are discrete in terms of continuous navigation but are interconnected conceptually and visually. They borrow their names from real Hong Kong locations but bear neither structural nor spatial resemblance to their prototypes. They do adopt some of the visual style and recognizable artifacts typical to Hong Kong.

It is not our intention to suggest that game environments ought to mimic the spatial structures of real locations (though this can sometimes be a point of interest, for example in *The Getaway* [21]). We do suggest, however, that by failing to consider the processes of social interaction, use, and appropriation – all of which help to shape form and give it meaning – VE designers make

ineffectual a whole host of apparent real-world links. This inevitably restricts a player's ability to interpret and make deductions, to utilize or subvert, and, ultimately, to be engaged.

Protagonist

An important and unique element of any RPG system is the avatar of the protagonist that gives the player interactive access to the game-world. This access is conceptually and practically constrained by the game-apparatus and the tactical solutions of the game-system implementation. The avatar is defined by its appearance and functionality that are designed as an integral part of the game-world. As an extension of the game-world, the avatar is built ready to answer the environmental challenges (see [18] for the phenomenological discussion) in a way that supports smooth interaction and engaging game-play. However, the protagonist is more than its visible avatar. In *Shenmue II*, Ryo appears to have history, character and goals; he 'remembers' things, has idiosyncratic reactions to game-events and exhibits 'will' in his communications with the environment. The problem of believable, meaningful and emphatic character-development has wide and non-trivial implications but for the purposes of this paper, we would like to note one interesting aspect – the fact that, given Ryo's distinct and recognizable personality, the player intuits that Ryo possesses an actively developing mental image of his socio-spatial milieu.

Shenmue II directs part of the navigational and environmental information directly to the player even if it is given a schematic association with the protagonist (e.g. Ryo can purchase local-area maps that are shown via Heads-Up-Display (HUD)). More interestingly, some of this information is suggested via Ryo's system-controlled behavior in the environment or towards NPCs, we shall discuss the techniques in the section on presentation. Ryo's mental image is a static construction, pre-authored and external to the game mechanics similar to that of the game-world's fictional base. It does possess some apparent dynamism presented through event placement and mediation. Again, this does not need to be the case – the protagonist's environmental interactions can be potentially conditioned by an artificial intelligence (AI) engine similar to the way player-control and character autonomy are combined in titles like *The Sims* [22] or *Black and White* [3]. Whatever the structure of the protagonist's personality, it provides a point of interest and relevance for the player as well as a connection between the player and the environment.

Player

The composition and development of the player's mental image is dependent upon a balance of a number of parameters some of which can be controlled or influenced by the game system. The player's personality, sex, age, cultural background, knowledge, first-hand experience of real-life environments, knowledge of similar systems and long-term interests can be approximated as constants within the experiential span of an RPG title like *Shenmue II* (of course if a player comes back to a game-world after a considerable amount of time or participates in a persistent environment such as an online RPG, these parameters can also acquire a significant degree of dynamism). Among the dynamic parameters that are conditioned via interactions with the game-world are the emotional state of the player and his/her game-world knowledge that are tied together in a dynamic mental image. The acquisition, current state and deployment of the mental image are dependent on the available perceived

resources and goals that can be purposefully structured via game-mechanics and mediation.

Presentation

Any VE is a mediated construct. Without deliberately selected and rendered images and sounds, it remains inaccessible for direct experience. The event-sequences, structured interactions, challenges, puzzles or linear narrative-insertions have to be given specific presentational structure and, thus, become an inextricable part of mediation.

This section looks at game-mechanics, narrative events and mediation from a very particular perspective considering them as presentation devices that inescapably influence and manipulate the mental image of the player. *Shenmue II* is a single-player game that makes interesting but limited use of resources and capabilities conceptually available at this important point of control. Presentation techniques like event selection, agency structuring and mediation all help to develop the player's curiosity and the sense of suspense by confirming, restructuring or refuting the player's environmental expectations. Places have great potential for variety and surprise as they change with daily and seasonal cycles, grow old, get appropriated for new uses or rebuilt. Multi-player settings have even more interesting potential as the presentation of one place can be made different for different players.

The perception of functional probabilities, that is a consequence of past actions, is so important that it is possible to say that 'the only world we know is determined by our assumptions' [13] (p.4). Biased by purposeful event selection and presentation, these assumptions can develop conflicts of interest or emotional attitudes that will serve to change the reading of the game-world and dramatize the choice of situated actions in support of content delivery or game-play.

Shenmue II provides (or, rather, enforces) several structurally and rhythmically different ways of engagement with the environment. Each of these ways serves multiple ludic and narrative goals within the structure of the game. We would like to draw attention to the fact that they can be seen (and designed) as presentation devices that have the power to provide dramatically interpreted portrayal of the environment by controlling contextual placement, meaning-assignment, attention-direction, temporal dynamics, spatial relationship definition and development, dramatic user-positioning, user-characterization, interactive-flow interpretation and focalization.

Exploration. In this mode, interaction with the VE occurs through free navigation. Free movement is essential for our understanding of complex spatial environments. The range of functional avatar's movements is kept to a bare minimum in *Shenmue II*. The avatar can stand, turn, walk and run. The third-person camera that 'floats' behind the avatar at a fixed distance can be rotated or zoomed. Being in a particular place in a particular time is important in *Shenmue II*, time flows and the environment responds accordingly: shops close, work stops, Ryo has to sleep. The quest-related and environmental information is distributed between places, objects and NPCs. Travel and active enquiry are essential for progress.

Lexia. These are minimal pre-determined narrative units that are assembled into conversations or object-manipulation operations (see Fencott [8], for the discussion of narrative units in *Shemue*). Ryo can ask people for information and soon some basic 'social' patterns of NPC behavior emerge: passer-bys are

more ignorant than locals, male shopkeepers are too greedy to give free advice and young female employees are (as the cliché demands) a treasure chest of gentle talk and useful tips. Simplified and systematic as these patterns are, they still provide a unique introduction to places: the player learns that the local city life is unquiet and abundant with petty thugs and dodgy dealers praying for naïve newcomers.

Image 3: Lexia. The *Fu Hoi Diner* waitress gives advice.

Cut-scenes. Cut-scenes in *Shenmue II*, and often elsewhere, are used as a strategic technique that helps overcome conceptual and technical difficulties in advancing the narrative and portraying events where timing or bodily contact are important. They are also used to deliver important information and attempt to characterize and create atmosphere using cinematic editing. For our discussion, it is interesting how they are used to balance the way the player identifies with Ryo and, particularly, how they influence spatial understanding and behavior.

Image 4: Cut-scene. The bag is stolen.

Quick Timer-Events (QTEs). These require the player to press certain control-button sequences. They can be rather abstract tests of attention and skill or loosely correspond to the required movements such as ducking or jumping. QTEs create interesting effects when used in conjunction with dynamic place events. They help to enhance anxiety and information-overload, altering the interpretation and understanding of locations and exerting influence over the mental image of the player and his/her resulting emotional state and behavior.

Image 5: QTE. Wong escapes into the backstreet.

Free battles. These are presented in a distinct mode with the camerawork and controls dissimilar to the rest of the game. Battles can be a culmination of a sequence, an introduction of a character or training. Their sequential and spatial placements are motivated by the narrative progression and character development and as such allow the player to develop his/her skill as well as the avatar abilities. Free battles do have implications for character development and interpretation of the environment; however, their conceptual and technical implementations in *Shenmue II* restrict their fusion with the cityscape and as such are less relevant for our analysis.

Image 6: Free battle. Ryo confronts the thugs.

Mini-games. The most abstracted type of agency in *Shenmue II*. These games might add to the character of places such as pubs but do little for interpretive presentation of the protagonist or the game-world.

Presentation of the protagonist in *Shenmue II* draws on his fictitious personality and mental image. Ryo's expressive capabilities include the aforementioned lexia-like speech and animation mini-scenes in exchanges with NPCs, extended dialogs and action sequences presented as cut-scenes and characteristic movement in free battle and mini-game events. In addition, Ryo thinks aloud and reacts in a way that delivers additional information and advice. Ryo's expressive range is used for a dramatic effect, as the player does not know the exact results of exercising agency via Ryo's avatar: it is only possible to guess at what will happen if Ryo is made to engage with an object or an NPC.

The expressive use of spatial mediation devices such as cameras, lights, sounds and effects is limited. *Shenmue II* provides some interesting examples that demonstrate how event placement and camerawork can direct attention and add significance to places; however, cinematic editing is only used in pre-

determined scenes and does not seek to assign contrasting atmospheric interpretation to locations.

EXAMPLE: WONG SEQUENCE

A Hong Kong street-urchin by the name of Wong is introduced with a particular place-event (see our GIGGROUP[4] note for the introduction of the term) sequence that begins when he and three fully-grown thugs set up a confidence trick to steal Ryo's bag. The need to recover an essential item lost with the bag makes Ryo embark on a search-and-recover mission. Even though the length and forms of the sequences are variable at many points and depend on the interactive choices and skills of the player, the primary structure and the role of the sequence in the game-progression remain the same. The scenario considered below, which took about twenty-five minutes to complete, will be sufficiently illustrative for our purposes.

The sequence unfolds in *Aberdeen*, a port area containing a mixture of different kinds of people with a significant proportion of shady characters who prey on tourists. The player (like Ryo) is unfamiliar with the setting and has to rely on a heuristic approach of conversing with random locals or exploring the neighborhood. Real-world common-sense logic comes into play and suggests a way to behave.

> *Worker's Pier*. Ryo directs his steps towards *Wan Chai* where he has business. A cut-scene is triggered (1): the camera follows a girl on a motorcycle who drives at speed through the area. Accidentally, Ryo gets in the way and meets *Joy*, a new character; Joy warns Ryo about the thieves in the area. Joy departs and Ryo is on his way when another cut-scene begins (2): Wong appears and asks for help; Ryo steps into a side street, prepares to fight the thugs, puts his bag on the ground and has it stolen; The thugs escape and Ryo finds himself near *Fu Hoi Diner* (3). The player is again in control.

What does this episode achieve in terms of the player's mental image? In *Shenmue II*, the city is divided into distinct areas with explicit points of access which are accompanied by a recurring sequence (the player sees a map-vending machine; the avatar slows down, an area title appears on a splash screen, the player is back in control in a new area). In contrast to typical real-city situations, *Shenmue II* city-areas exhibit characteristics of cell-like interior spaces. The division is, perhaps, a result of a technical restriction on the size of the environment that the hardware can handle at one time; however, the game exploits this to signify the locations and control the interactive flow. The area behind the location of this episode is *Beverly Hills Wharf*, a dangerous place under the control of the *Heavens* gang whose leader Ryo will have to confront. Importantly for later game-play it is inaccessible to the player at this moment. This episode denotes the place of entry to *Beverly Hills Wharf* and introduces the type of characters that can be met there. The player forms and readjusts his/her set of localized expectations that, as we have discussed before, influence perception, give interpretation to past interactive decisions and guide future judgment and action-selection. The player finds him/herself situated within the temporal dynamics of the socio-spatial game-world. We can say that as the player projects his/her presence through the avatar into the

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[4] Nitsche, M., Roudavski, S. with Penz, F. and Thomas, M., Narrative Expressive Space, in SIGGRUOP Bulletin (to be published); download from http://www.stanislavroudavski.net (as of 29 August, 2003)

systematic game-world, the situational (phenomic) environment takes shape in his/her head.

Image 3: Wong Sequence map (refer to the event numbers in the transcript).

At the same time, the player is introduced to the relationship between Ryo and his new environment. Ryo is preoccupied with his mission and appears to be somewhat disinterested in the environment. This is in contrast to the interests of the layer, indeed the game-world is intended to be among the greatest attractors at this moment. Ryo is rather rude to Joy who seems to take interest in him. On the other hand, he is prepared to step towards danger and defend an unknown boy when the situation requires. The player is likely to be familiar with the conventions of RPGs and knows to expect danger. The player's intuition during communications with NPCs is bound to be different from Ryo's. This produces a twofold effect. Firstly, Ryo's character, abilities and motivations are outlined and the player begins forming an attitude and expectations towards Ryo. This is a potential source of drama and a way to introduce and develop a character that is unique to the interactive worlds. Secondly, potent elements of the environment are brought to the fore and given a particular interpretation via Ryo's 'willful' interference. This technique provokes the player to consider situations that might be not among his/her first choices due to his/her temperament or knowledge. In this way, the potential of the environment is interpreted and presented in a distinct and deliberate manner. In addition, this episode serves as a source of proairetic suspense similar to that employed in literary or cinematic narratives: what will be the resolution of Ryo's action? In *Shenmue II,* the effect of this kind of suspense is further reinforced by the fact that the player has his/her control removed only momentarily and unexpectedly. Furthermore, the player knows that the effects of this interference will have a direct impact on his/her further free engagement with the game-world. The stakes and emotional involvement are higher than in the case of a film or a book where no control is possible at any time and the spectators, however strongly they feel for the characters, have to resign themselves to a passive role of powerless onlookers: the lack of agency implies no personal responsibilities and consequences. Both effects are achieved through avatar's active system-driven interaction with the environment.

The editing and placing of this particular cut-scene is not without problems. The player could not have explored the area that the cut-scene takes him through before it begins: the loop-like passage is blocked by some barrels and the game does not provide a jump function. The scene begins at one end of the loop and ends at another, the middle is cut out. The loop is rather long and includes several right and one (last) left turn. The cinematic mediation, as implemented in this episode, fails to gives an indication of this space or time that was needed to run through it. The result is frustrating confusion that cannot be resolved without a map. Despite the exit point being very near the place where the cut-scene begins, the player feels disorientated and has to look for familiar landmarks to regain his/her bearings. Disorientating editing can be used deliberately to create or enhance an effect of tunnel-vision (characteristic of people giving chase), and leaving the player to cope with consequences. However, in this particular series of events the confusion does not appear to be exploited later in the game towards any particular effect. In this case, the game suggests a dynamic spatial experience of high tension and concentration via a cut-scene. Later in the sequence, we shall see how emotional and perceptual conditions during a chase can be reconstructed and interpreted with interactive means.

> *Worker's Pier.* Ryo is in an unfamiliar place and his possessions are gone. He is in trouble and has to make most of what his

> environment has to offer. The player conducts an area search but
> fails to get any results: the thieves are gone. The player
> initiates conversations with the passers-by, also unproductive. A
> girl who works in *Fu Hoi Diner* mentions the notorious Poison
> Brothers (3) and gives directions towards *Queen's Street* where they
> are likely to be in a porridge shop. The player directs Ryo towards
> *Queen's Street* and the game loads this new area showing the area
> name and the time on a splash screen.
>
> *Queen's Street*. As Ryo approaches *Ling Ling Porridge*, another cut-
> scene begins (4): he asks the two drinking guys about his bag, they
> get aggressive and demand money, one pulls out a knife; Joy appears
> on her bike and stops the quarrel; She knows the boy who stole the
> bag and sends Ryo to *Pigeon Park* to look for him; Ryo leaves
> abruptly without stopping to talk and Joy disappears in the
> opposite direction. The control is returned to the player.

This second episode introduces the player to the navigational convention by taking him/her over the boundary of the area where the sequence begins and develops the relationship with Joy further. The quarrel with Poison Brothers assigns an emotional value to *Ling Ling Porridge* that is now remembered as a place of notoriety, a fact that can be related to later in the game.

> *Worker's Pier*. Ryo heads towards *Pigeon Park* (the caption 'This is
> Pigeon Park…' appears on the screen). A search in the park gives no
> result. The search is interrupted in the centre of the park when
> another cut-scene (5) is triggered where Wong is shown playing
> behind the despairing Ryo.

The scene establishes a visual connection between the bay with the city backdrop, the fountain, Ryo, Wong and the flower beds that flank the park separating it from the busier and more topologically complex area of the pier where the next stage of the chase takes place. The cut-scene provides a rewarding resolution after a suspenseful period of unsuccessful search and sets up the localized conditions for the ensuing interactive series of events.

> *Worker's Pier*. Wong sees the approaching Ryo and runs away into
> narrow back-street passages. A QTE is triggered as Ryo attempts to
> jump over the marbles that Wong spills in his way (6). The QTE is
> not successful, Wong escapes and the player finds him/herself in a
> backstreet area near *Lai Lai Eatery*.

An introduction of a QTE into a pre-determined episode draws the player's concentrations towards a series of high-speed reflex-driven actions (only one in this introductory example) and away from the environment. This is successful as an interpretation of perceptive and emotional conditions during a real chase where the stress and danger of the high-speed movement makes people concentrate on intuitive navigation only. At the end of the series, the player is in a place that was accessible before but is very unlikely to have been visited or remembered. Now, having an association with a memorable event and having experienced the quick-sketch representation of the path, the player is faced with the task to find the way out. This episode introduces a new location, associates it with an emotionally significant event and makes the player actively rework his/her mental image of the environment in the selection of the next interactive step.

> *Worker's Pier*. The player chooses to talk to the people in *Lai Lai
> Eatery* and the hostess directs him to a place where Wong was
> recently seen. Ryo follows a zigzag backstreet and is back in front
> of *Fu Hoi Diner* (3).

By now *Fu Hoi Diner* has already been established as a local landmark. Now, the newly explored portion of the area fits together with the previously known

elements of the mental image. Further meaning can be added to a location as similar or contrasting events occur in its vicinity and reinforce or upset player's expectations.

A string of similar scenes and events follows; the challenges increase in complexity and difficulty and take the player into new corners of the pier along new characteristic routes until the moment Wong is caught. Throughout the rest of the sequence the player can rely on several established places (like *Fu Hoi Diner*) for information and orientation.

> *Worker's Pier.* Ryo enters a free battle with the thieves (7) and defeats them. Wong guides him across the area to the hidden bag (8). Wong provides Ryo with a sketch map that shows the route towards Ryo's the next goal and they part ways for now…

CONCLUSION

This paper suggests that the spatial nature of RT 3D VEs is a characteristic that, along with interactive access, defines them as an expressive medium. VEs can be made more meaningful, expressive and dramatically engaging with techniques that rely on their spatial context. The first part of this paper overviews current theoretical perspective on person _ environment relationship and describes it as an interactive process. Environment is understood as a holistic phenomenon that structures behavior and is defined by it. Our involvement with the environment is through activities and the spatial world as we know it is subjective to this involvement. Mental images of our environments change with time and differ between people. VEs, represented by a RPG videogame in our discussion, rely on a system-driven presentation-structure to give visual and interactive access to their content. The presentation structure includes a layer of mediation (i.e. cameras, lights, sounds, effects) that can rely on cinematic techniques to interpret the VE. In addition to mediation, the interactive events – their placement and structure – also have a significant impact on the users' emotional state and their ability to understand their situation. In addition to other interpretations that describe interactive event-structure as a part of game-mechanics, event-structures can also be considered to belong to the presentation structure. This paper uses a sequence from *Shenmue II* to illustrate how the process works in practice. Powerful expressive and dramatic possibilities lie in the capacity of computers to generate meaning by providing interactive access to spatial worlds and drama by creating purposefully mediated, individualized experiences that can foster understanding, emotional involvement, interpersonal tension, collaboration or competition.

Videogames are a thriving and quickly developing field, an understanding of which could benefit from the knowledge and techniques developed by existing theoretical and practical spatio-social analysis and design techniques. On the other hand, this field provides versatile material for theoretical experimental enquiry into place-making and representation that a host of disciplines can benefit from. Continuing the work presented in this paper it would be interesting to take the case-study analysis further by considering the impact of spatial configuration and presentation on user groups. Another line of approach is a possibility to apply analytic techniques (e.g. Space Syntax [10][11]) to the spatial structure of VEs. This remains as work for the future.

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