Entertainment Computing 5 (2014) 71–82

Contents lists available at ScienceDirect

Entertainment Computing

journal homepage: ees.elsevier.com/entcom

A spatial analysis of the JBA headquarters in *Splinter Cell*: *Double Agent* ☆

Paul Martin *

University of Nottingham Ningbo China, AB 422, 199 Taikang East Road, Ningbo 315100, China

ARTICLE INFO

Article history:
Received 15 October 2011
Revised 6 December 2013
Accepted 17 December 2013
Available online 9 January 2014

Keywords:
Space syntax
Splinter Cell
Isovists
Visual analysis

ABSTRACT

Three measures drawn from space syntax are proposed as means of describing game spaces with a view to a morphological critical analysis. These measures are: core integration and segregation, isovist area, and visibility/accessibility discrepancy (VAD). The measures are applied to the JBA headquarters levels in the stealth game *Splinter Cell*: *Double Agent* in order to evaluate the space in terms of the navigational challenges and affordances with which it presents the player and in terms of the rhythms of tension and relief inherent in its layout. It is demonstrated how these challenges and rhythms are married to the specific game tasks and events that each level contains.

1. Introduction

One important aspect of many videogames is the morphology of the game space. The layout of a game space can be an important factor in determining the level and type of challenge the game presents, the strategic and tactical options made available to the player, and the level's atmosphere, or how it feels to inhabit the space. It is useful, therefore, to develop a critical language that is able to describe different game morphologies with some precision.

While some writing on games has been content to talk about game space using general terms such as 'open' and 'linear,' there have been efforts made to treat the topic with more analytical rigour.

Ernest Adams examines architecture in games, by which he means both buildings and landscape, and suggests it serves primary and secondary functions [1]. The primary functions are to do with gameplay and include constraint, concealment, obstacles and exploration. The secondary functions are to establish the game world, give it a certain atmosphere and provide the player with information. Michael Nitsche identifies several kinds of spatial structures that we find in games [22]. These are tracks and rails, labyrinths and mazes, and arenas. By putting these forms together in different ways designers control the kind of experience that a level offers players.

Steven Chen and Duncan Brown adopt a similarly architectural approach to level design [5]. Drawing on Francis Ching's introductory architectural textbook they look at game space in terms of circulation patterns and overall organization of the space. Kenneth Hullett and Jim Whitehead have taken a more focused analytical look at design patterns in single player first person shooters [16]. They identify nine recurring patterns in the genre, such as sniper positions and choke points, describing them and detailing their impact on the game.

While these writers have correctly identified the relationship between form and experience in videogame space, we do not have a method for looking in detail at the configurations that underpin this relationship. The tendency is to look at broad types of spaces: arenas, sniper points etc. rather than the local spatial relationships that give rise to these types. In order to establish an approach to the morphology of game space that can conduct a critical analysis at this more abstract level, an adaptation of the architectural and urban planning theory of space syntax is proposed.

2. Space syntax

First described in Bill Hillier and Julienne Hanson's *The Social Logic of Space*, space syntax is a method of investigating the internal relationships of a spatial system [14]. Just as linguistic syntax refers not to individual units of speech but to the way in which these units are arranged into sentences, so space syntax focuses on the arrangement of discrete spaces in a larger system. This goes beyond looking at the relationship of contiguous spaces. Knocking through a wall to connect neighbouring rooms in a house clearly affects the character of those rooms, but it also affects the house as a whole. Specifically, it will affect the way the house is used by its inhabitants, who may begin to prefer different routes and neglect routes that were previously preferred. This in turn alters the function and atmosphere of the rooms affected. Space syntax seeks

☆ This paper has been recommended for acceptance by Matthias Rauterberg.

* Tel.: +86 0 574 8818 0172.
E-mail address: paul.martin@nottingham.edu.cn

1875-9521/$ - see front matter © 2014 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.entcom.2013.12.001

to describe this more complex set of relationships. It is based on the insight that the character of a spatial system, whether a house, a museum, or a city district, is determined not only by its visual properties such as material, décor and architectural 'set-pieces' such as colonnades and architraves, but also, and often primarily, by the relationship of each space to every other space in the system. This set of relationships is known as configuration and is defined by Hillier as 'the simultaneously existing relations amongst the parts which make up the whole' [12].

While much architectural theory aims at the conscious level – those things we see and consciously grasp – space syntax looks at aspects of architecture that are intuitively felt, but not easily vocalised. They are, Hillier suggests, 'non-discursive,' working 'below the level of consciousness' [13]. But these relationships are, it is claimed, central to how space is used.

Different kinds of spatial structures lead to different patterns of engagement. Certain spatial formations rigorously determine how they will be used. The traditional layout of a church or a courtroom, for example, in which the entrances and exits of each user are prescribed and everyone is aware of where they can and cannot go, is of this kind. Others, such as a public park, allow for users to engage more freely, choosing their own routes through space. Hillier distinguishes between these two models of space, calling the first a long model and the second a short model. Long models tend toward conformity and conservation, whereas short models tend toward the inverse of these: individuation and morphogenesis [13]. In spatial terms, this means that long models tend to be similar to each other (conformity) and tend to reflect in their form the rules that constitute them (conservative), whereas short models tend to be more variable (individuation) and give rise to new spatial relationships (morphogenesis). However, this is not solely a predictor of spatial layout but also of the social relations that obtain through this layout. The space of religious ritual tends to strictly determine not only the relationship between spaces within the system but also between people who use those spaces. Buildings based on a long model, such as churches and courthouses, 'conserve given social statuses and relationships' whereas those based on a short model, such as parks and social clubs 'generate relations over and above those given by the social situation' [13, p. 6].

In an insight related to museum design, but that may be of particular relevance to videogame criticism, Sophia Psarra relates the long and short model to Umberto Eco's notion of the closed and open text. She suggests that 'the former prescribes experience, while the latter shapes a social pattern of social co-presence' [29, p. 230]. Psarra sees these two modes as embodying two different types of buildings, stable and variable:

> buildings in the first group are concerned with unambiguous semantic expression using the spatial properties to strengthen a representational geometric order and the content of the collection. The second group consists of works that are 'open' allowing spaces and artefacts to enter into multiple relationships rather than structuring interpretation [29, p. 230].

Psarra sees the Victorian museum, for example London's Natural History Museum and Chiswick Villa in the former category; the more post-modern NY MOMA and John Soame's house-museum she sees in the latter.

A similar distinction, though with different terminology, is made by Yoon Kyung Choi [7]. Here, focusing on the relationship between a building's configuration and its mode of interaction, the long model becomes 'the deterministic model' and the short model becomes the 'probabilistic model.' The former 'dictates viewing sequences and channels encounters in limited ways,' whereas the latter 'modulates exploration and encounter statistically according to the syntactic properties of the layout.' [7, p. 241]] Choi gives the example of the Hammer Building in the Los Angeles County Museum of Art as a deterministic model, in which visitors simply move from gallery to gallery in a predetermined sequence. It should be noted that the probabilistic model does not give rise to a simply random pattern of movement in the museum but rather movement that is a function of the way spaces are interconnected. In other words, it should be possible to predict within certain statistical parameters the kind of movement that the probabilistic model will give rise to. This idea of conservative and generative spaces has clear applications for providing a method of analysis that goes beyond terms like 'linear' and 'open' and instead looks at how movement through open worlds might be understood and structured in terms of the design of those worlds.

This approach to an analysis of videogames could be described in terms of formalist criticism. 20th century schools of literary criticism like New Criticism and Russian Formalism emerged in reaction to psychological and historical methods to understand how literature worked in itself; how particular poems created specifically literary effects through identifiable and analysable literary techniques. This kind of criticism in game studies would look to the techniques through which games affect players. It would bracket off certain aspects of player personality and competence, generic conventions and designer intention in order to concentrate on these techniques in themselves. This is not to say that these other elements cannot be re-integrated with a formal analysis to develop a fuller picture of the experience of game-playing, but in order to identify the important formal elements they must first be described independently.

This approach may be useful in describing how a space feels to play to a reader who is unfamiliar with the game. This is important in game studies since we are often writing about games that we cannot expect all of our readers to have played, much less to have played to completion.

Psarra looks at a number of public buildings, including several galleries, using space syntax to look at the relationship between architectural structure and perceptual and motor experiences. She attempts to bridge the gap between the space as conceptual and space as experiential, seeing space syntax as a method of analysing how the designed space relates to the observed or experienced space. This relationship between the form of the designed space and the experience it gives rise to is of clear importance in game environments.

Hillier claims that buildings transmit culture but 'invariably we handle domestic space patterns without thinking of them and even without being aware of them until they are challenged' [13,30]. Perhaps this challenging of our unconsciousness of space is precisely what is happening in many games. Space is foregrounded in games in a way that language is foregrounded in poetry; forcing us to take stock of a taken-for-granted tool of cultural transmission. Hillier explains:

> Architecture begins when the configurational aspects of form and space, through which buildings become cultural and social objects, are treated not as unconscious rules to be followed, but are raised to the level of conscious, comparative thought, and in this way made part of the object of creative attention [13, p. 32].

In order to adapt space syntax to videogame analysis, this paper will offer a critical appraisal of one game using methods drawn from the discipline. Space syntax takes complex three-dimensional systems and models them in two dimensions. The model is then used to describe relationships of vision and access across the