

The Spatial Syntax of Iraqi Refugee Housing in Syria.

Regan Potangaroa, Dept of Architecture Unitec Auckland NZ.
email: rpotangaroa@unitec.ac.nz

Tao Chan, Post Grad Student, School of Architecture, Auckland University Auckland NZ
email: calfchan@hotmail.com

Abstract

Space Syntax developed from the work of Benedikt in 1979 and then Hillier and Hanson in 1984. Benedikt created visual maps within building plans by drawing the contours of equal visual areas calling the resulting map an 'isovist field.' He theorized that these isovist fields would correspond to the pattern of people's movements and provide insight into how a space was navigated. This theory was confirmed by Hillier who together with Hanson went on to develop the approach by using a grid of nodes. Lines drawn from each node established the connectedness of that point to the remainder of the grid points within the space being studied. And it was from this that the visual graph analysis approach and spatial syntax emerged. The spatial tool has the ability to draw out spatial patterns from 2D floor plans that would not otherwise be easily quantified and it is this quality that is the subject of this paper.

The paper applies the approach to the last 5 remaining households at El Hol camp in Syria of refugees from the 1990-91 Gulf conflict. The basic house data was collected in February 2003.

The results support the idea of an "intimacy gradient" being inherent in the building design which may not have been otherwise identified. And that this gradient appears to be important, it is certainly vernacular, extremely subtle and perhaps fundamental at least to the design of this housing. It will be interesting to compare and discuss whether that was the case for housing in Gujarat and other areas.

This paper seeks to extend earlier qualitative work on "Talking to the Building" presented at i-Rec 2008 and the use of Quality of Life surveys to measure whether people were "happy" presented at both i-Rec 2006 and 2008 as a way to understand and also verify the needs of the building's occupants

Keywords: space syntax, housing, qualitative, design.

Introduction

In the lead up to the conflict in Iraq in 2003, aid agencies set up operations in Syria in the expectation of a large influx of people from Iraq crossing the border. There were four main border-crossing points from Iraq into Syria. Two of these are located at Fishkabur and Al-Yaroubia, some 200kms and 150kms respectively northeast of the provincial town of Hassake. The Fishkabur crossing point (Also called Simalkeh) faces northern part of Iraq, which was under the control of Kurdish entities. The Al-Yaroubiya crossing point faced the Al-Rabeea area of northern Iraq then under the control of the Iraqi central government. Mostly, traders currently use it. The other border entry-points were Abu Kamal about 150 km southeast of Dir Ezzor and Al Tanaf 250 km east of Damascus. Al Tanaf was the official border point for all goods entering Iraq as part of the Oil for Food Programme. Camps were set up near to Al-Yaroubiya, Abu Kamal and Al Tanaf but the camp associated with Al-Yaroubiya, called El Hol, was an existing refugee camp from the previous 1990-91 Gulf War. It was home to the last 5 families from that earlier influx and they had over that time established “permanent” houses in the camp. And it was the spatial design of these houses (using a space syntax approach) that is examined in this paper.



Figure 1. Typical photographs of the 5 houses used in this study.

Research methods

The research method in the field only required measurement of the houses for the production floor plans. However, the protocol and culture of the people meant that this could only be completed either by a female who was married and preferably “known” to the family or by a member of the family. Both approaches were used with 2 plans requiring small modifications to adjust for the thickness of mud walls that were missed. At the time of the house measurements the idea of using a spatial analysis approach was not planned. However, the rare opportunity to gather such house data and the sense that there was something “unique” and seemingly vernacular about the houses was felt and it

was much later that the opportunity to analyse the house plans was realised. This was the basis for the research questions below.

Research question or research hypothesis

- What if any are the common spatial “patterns” inherent in these houses?
- How useful is space syntax as an architectural tool?

Space Syntax

The spatial syntax approach starts by applying a grid layout to the area of concern which is then analysed. This analysis is based on the notion that spaces can be broken down into components, analysed as networks of choices, then represented as maps and graphs that describe the relative connectivity and integration of these grid spaces. It rests on three basic conceptions of space (Wikipedia, 2009):

1. An isovist space is the total area that can be viewed from a point. (Benedikt, 1979)
2. An axial space or line is the longest straight line that can be walked from a grid point (Hillier & Hanson, 1984)
3. Convex space is the space where no line between two grid points crosses the perimeter (Peponis et al, 1997). For example, if the space were modeled as a wire frame diagram then no line between two of its points goes outside the perimeter of the wire frame. All points within the polygon are visible to all other points within the polygon

The 3 common analysis methods used are as follows

- Integration measures how many turns or changes of direction one has to make to move from one space to another using the shortest path/s. The term used is “Depth” and the spaces requiring the least average number of turns to reach all other spaces are the most integrated while those with the most are segregated. Integrated areas are mapped as red (hot) and can be characterized as public, busy and community focused. Segregated areas are mapped as blue (cold) areas and are characterized as private, quiet, secluded and out of the way.
- Choice is a measure of the “flow” through a space and can be visualized as a water source at the start point diving equally at each spatial intersection.
- Depth Distance is a measure of the overall depth of one space of concern to all other spaces. It is usually shown by a justified graph where spaces 1, 2, 3, 4... depths away are shown on levels 1,2,3,4 respectively. When the mean depth is high resulting in a tree like structure the system is described as deep and the spaces as far or distant. Where the mean values are low will give a bush like structure and the system is described as shallow and the spaces are near.

For this study an isovist map approach was used with an integration analysis using the space syntax software called DepthMap. Such an approach is useful in quickly establishing common spatial patterns.

Research Objectives

- To better understand vernacular house design (when there are no architects)
- To gain a more informed understanding of house design leading to a fundamental understanding of “home” as opposed to “house”.

Research results

The research results from DepthMap are the isovist maps shown in figure 2 below. These are based on the house plan geometry measured in the field (shown as black lines) and consist of colour coded contour maps with the most visible areas being red and the most “invisible” being dark blue. Between these two colours are varying grades of visible/invisible represented by the changing colour spectrum. The supposition that red areas are “public” while blue are “private” areas seems reasonable.

Care was taken in modeling the area around the house so that it best reflected what was happening inside the house (rather than being relative to what was outside it) and in so doing better map the inside detail. All the houses typically have a 1.8 metre perimeter wall with a courtyard immediately inside the entrance and therefore the outside boundary (that contained the house plan) was tuned to give a “redish” area at the front gate to ensure that detail inside the house was adequately captured.

Discussion and conclusions

A visual comparison of the isovist maps suggests the following:

1) The court yard of the houses is central to the spatial planning/experience of all the houses except house 2. With house 2, the relative long corridor to the courtyard makes any entrance both awkward and also unobserved. Moreover, it appears to even out the visibility throughout the remainder of the house resulting in a lack of spatial differentiation, all rooms seem to be of equal visibility. On the other hand, houses 1, 3, 4 and 5 show more differentiation of spaces and rooms due to the positive character of the courtyard and the entrance on to it.

In addition, in houses 3 and 4, not only is the courtyard entrance clearly visible to those in the house (which would be important for security) but it also leads directly to the entrance of the house. On the other hand in houses 1 and especially 5, the most visible area of the courtyard are contained within the courtyard and appear to be controlled by the orientation of doorways into the house. Doors oblique to the front entrance generate the isolated visibility areas seen in houses 1 and 5 while perpendicular doors generate direct “pathways” from the main entrance into the courtyard and the entrance into the house.

2) Following on from 1 there does appear to be what Alexander calls an “intimacy gradient” in all the houses in varying degrees. Alexander states that “unless the spaces in a building are arranged in a sequence which corresponds to their degrees of privateness, the visits made by strangers, friends, guests, clients family will always be a little awkward”. In house 2, the toilet (marked as a “T” in figure 2) is located down an alleyway directly off the courtyard and as Alexander suggests is awkward. To a lesser extent in

house 1 and in house 5 the oblique door to the toilet appears to make their toilet less visible but nonetheless “private”. The toilet is located inside for houses 3 and 4 which appear to create a more resilient intimacy gradient while also making the toilet a lot more accessible during the night and in the winter.

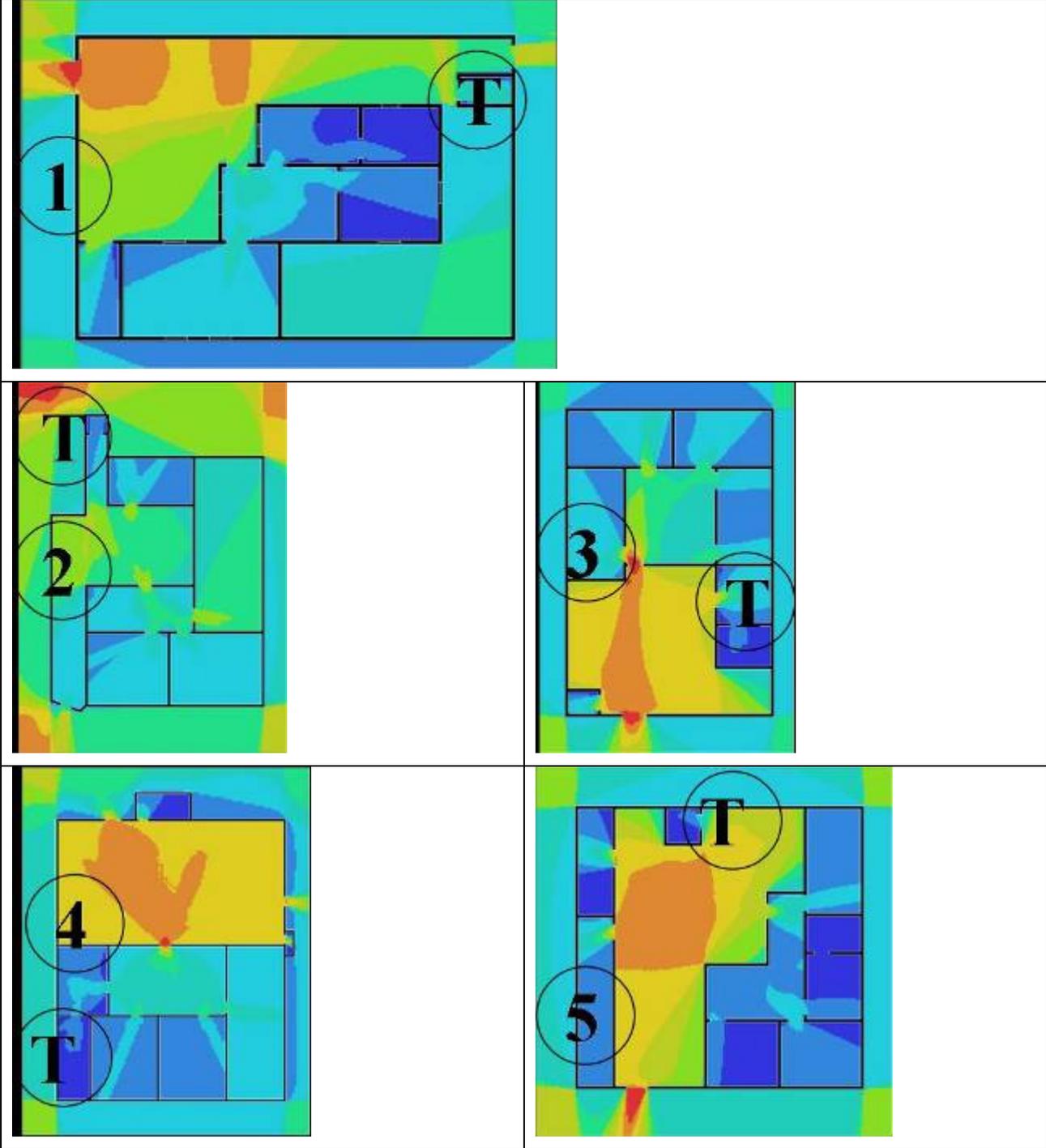


Figure 2. Isovist maps of the 5 refugee houses

3) The inside/outside character of the houses seems to be better exploited when there is some differentiation of visibility in the courtyard area. Such differentiation creates areas that people can take up (such as when working) and be out of the way yet still in contact with what is happening in the courtyard and house generally (Jacobson et al, 2002). This is particularly useful when watching over children for example. All 5 houses appear to have this characteristic in varying degrees with the least being in house 4 and the most in house 1 and 5. The spatial design key appears to be the inclusion of wall set backs creating pockets of less “visibility” in and around the courtyard area. In addition, it creates spaces that Jacobson refers to as “private edges, common core” where a good home “balances private and communal space”. This could be better realised by more doors or wider doors.

Hence, coming back to the two research questions posed at the start of this paper it would appear that there are common spatial “patterns” inherent in the 5 houses used for this study and that space syntax has potential as an architectural tool in interpreting what the buildings are telling us.

Key Lessons Learned

- Spatial syntax is a particularly useful tool for assessing the spatial character of houses.
- There does appear to be unwritten design rules built into these 5 refugee houses that are reflected in varying degrees.
- These rules appear to be based around the spatial importance of the courtyard and are developed by doorway orientation, wall set backs, and an apparent intimacy gradient into other parts of the house.
- Further research could seek to study the link between the isovist maps produced by a spatial syntax analysis with occupant use.

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Author's Biography

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