

Architectural Composition in Digital Space

Alexander Asanowicz

Faculty of Architecture, Technical University of Bialystok, Poland

Abstract. In this paper the possibilities of using the computers at course of architectural compositions are considered. As the start point of the new teaching method of architectural composition we used the course of tradition architectural composition, elaborated at our Faculty. The course of Digital Architectural Composition was finished in 2002. The main goal of using the new digital media for modelling architectural forms was checking the new possibilities of form creation. Traditionally, searching of forms at the conceptual design stage is performed by using sketches, drawings and physical models. Our new method showed that is possible to do the same thing using the computer-based 3D modelling, experiencing no physical limitations of the 'real' substance. At the same time, at the early design stages, when formal value is sought, computer modelling can be done almost intuitively. In ours work we try to find a creative way of using computer - transforming the tool into medium. The attention was paid on exploring the possibilities characteristic for computers and not available with traditional methods of modelling. Architect's tradition tools are effectively replaced by a computer, which create a new way of doing things.

Keywords. Architectural composition, computer modelling, method of teaching

From Traditional to Digital Architectural Composition

In traditional architectural compositions cardboard models are used. Our course of traditional architectural composition in general, was concentrated on the abstract composition exercises (façade, solid model, transformation, walk-through the open space, sequences, and walk-through the internal space. First time we introduced the digital media to Architectural Composition course in 1997, after many years of experience with teaching traditional architectural composition. When we decided to use the new digital media for modelling architectural forms we would like to check the new possibilities of form creation. For experiment we chose the solid form modelling. The main reason for this was fact that exploration of 3-dimensional space and 3-dimensional volumes in space is one of the most basic

and fundamental architectural activities. In this experiment one group of 1st year students was participated. Usually, at the conceptual design stage architects use sketches, drawings and physical models. Our experiment showed that is possible to do the same thing using the computer-based 3D modelling, experiencing no physical limitations of the 'real' substance. At the same time, at the early design stages, when formal value is sought, computer modelling can be done almost intuitively. The achieved result was very promising. Simple operation with basic forms enables students to design architectural sculptures, forms with specific formal value. We decided to 'translate' traditional exercises into digital space and elaborate the whole course of digital architectural composition. In 2002 the whole course was elaborated. This course was including five groups of exercises: bas-relief (division, rhythm, façade); solid composition with specific

formal values (dynamic, light, massive, monumental form); transformation - from cube to parallelepiped; walk through (desert, valley, tunnel), walk through the internal space (space of celebration, contemplation and dynamic space). For each exercise we have elaborated the short description which project includes general remarks on exercise, goal, description of the exercise, and information about required skills and software. In this course we permitted for using all possible geometrical elements and surfaces with different colour and light. Practically in all exercises the animation is the obvious element.

Digital Architectural Composition

The process

The process of designing in both Traditional and Digital Course proceeded in the same way. The starting point was searching for the inspiration. Each student presented photos of existing architectural objects and a text, which explained the reasons of the choice. Next obvious stage was preparing the sketches of the idea. Sketches were discussed and on their basis the model of the composition was realised.

The results

The results of the four above-presented exercises performed by students can be divided into three groups:

1. In the façade projects we didn't observe any visible influence of the applied creation method on the resulting form. In digital creation methods the sketches of designed forms did not differ from the sketches using in traditional designing. As a result, forms designed by students in digital environment were similar as traditional carton models. The similarity concerned the degree of façade complexity. The reason for this situation is little knowledge of software capabilities.

ties.

But at the same time we could observe that students like to design variants of designing form.



Figure 1. Façade.

In these variants they try use different sources of lights for achieving different emotions during process of perception. (Figure 1)

2. In the process of creating a solid form we could see certain different results. They concerned both the chosen inspirations and the sketches and final models. Forms got more complicated, curvilinear planes and surprising transitions among particular elements appeared. All students 'discovered' the possibility to apply light to model form in more consciously way. Simultaneously, simple computer animation



Figure 2. Solid composition.

(walking around the solid) allowed for a dynamic search of the best perception points and better understanding of visual frame. (Figure 2)

3. The third group of results is connected with more complex compositions. Considerable differences appeared concerning both the inspirations and the sketches of the designed form. It should be mentioned here that some of the students preferred to design directly in digital space without the use of pencil. They claimed that they are only able to present their project verbally. It made

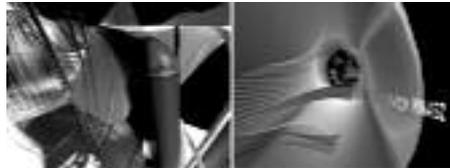
Figure 4. Passing through surrounded space.

teacher and student co-operation much more difficult, since the idea traditionally accepted in designing graphic convention was broken. Forms chosen as inspiration were much more complex, often organic or abstract. As a result, forms that could not be made in a traditional way were created. The level of freedom in designing space by computer methods differed substantially from traditional models. Gravitation was no issue there. It must be emphasised, though, that not only 'liquid architecture' was created. Also, 'no-function' (the traditional meaning) spaces were created. The only function of space was evoking emotions. Forms got more poetic and metaphoric. Students paid attention to the possibilities they had through applying various materials of different transparency. Many projects concentrated on playing with light and not form. Another important aspect differentiating the results of traditional and digital course of architectural composition was the ability to animate the passage. It required of the student to write a sort of scenario, to determine important places and spaces, to define perception points and the moving speed in certain places. In traditional models the viewer is 'outside the space'. He is just an onlooker. In digital models, he is 'in space'. One becomes an active participant of the space. The perception process becomes dynamic and the onlooker's emotional engagement increases. It is possible now to convey the emotional message of the designed spaces more precisely. This helps to better understand the relations between composition elements as well as their influence on emotions.

Figure 5. Architectural compositions looks as the bad game environment.

Figure 6. Because computer can do it

Figure 3. Passing through open space.



Problems

Analysis of the possibilities of using computers at course of architectural compositions has shown that using the new digital media for modelling architectural forms gives us new possibilities but at the same time creates new problems. When comparing the works we also observed two worrying phenomena. First, some of the works resembled bad computer games. They were too literal and contained too many details. (Figure 5)

Second phenomenon is hard to be named directly. We called it - 'Because the computer can do it!'. It is student's response to teacher's question about project motifs. It seems to result from too much fascination with the new medium. Students create not architectonic forms and space. (Figure 6)



Conclusions

In our work we try to find a creative way of using computer - transforming the tool into medium. The attention was paid on exploring the possibilities characteristic for computers and not available with traditional methods of modelling. Architect's traditional tools as a drawing board, a drawing ruler, a pencil, tracing paper, a sketch block and physical models are effectively replaced by a computer, which create a new way of doing things. In the process of creation ideas are born in the intellectual space of our mind. Thanks to the new technical possibilities we changed the process of thinking about architectural form creation. Araujo (1976) said that in designing we use at the same time intellect (intuition and mind), emotions (intuition and imagination) and logic (mind and imagination). Our last experience has showed that we should add the new element for these triads - computer as a digital medium.

References

- Akin, O.: 1986, *Psychology of Architectural Design*, Pion Lmtd.
- Araujo, I.: 1976, *La forma arquitectonica*, EUNSA, Pamplona
- Asanowicz, A.: 1996, *Using the Computer in Analysis of Architectural Form*, in A. Asanowicz and A. Jakimowicz (eds), *Approaches to Computer Aided Architectural Composition*, TUB, Bialystok, pp. 25-34
- Jakimowicz, A.: 1999 *An Intuitive CAAD*, in A. Brown, M. Knight, P. Berridge (eds), *Proceedings of 17th ECAADE Conference*, Liverpool, pp. 80-85

This paper was supported by the grant W/WA/1/02