A workshop for second year students.

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CAAD in visual environment impact assessment

In June 1993 the Computer Lab had the opportunity to organize a three-week workshop for approximately 10 students without any prior knowledge whatsoever of CAAD.

We decided to make the most of this chance to experiment with the CAAD training programme.

BACKGROUND
Normally our activities have been reduced to very short introductory courses on the one hand, and guidance of the students who want to make use of the computer when working on their assignments, on

the other. This method of instruction is in our view problematic, because it separates the introduction to CAAD from its use in the students' architectural exercises. The result is that the students see CAAD as a technique applied out of context, ie a technique isolated from their other activities.

With this criticism in mind we wanted to take the opposite approach in the organization of our workshop. Consequently, we decided to start out by defining the assignment and the professional objective, then to determine the method to be used for the solution of the problem and only at the very end was it decided which parts of CAAD were to be applied and introduced.
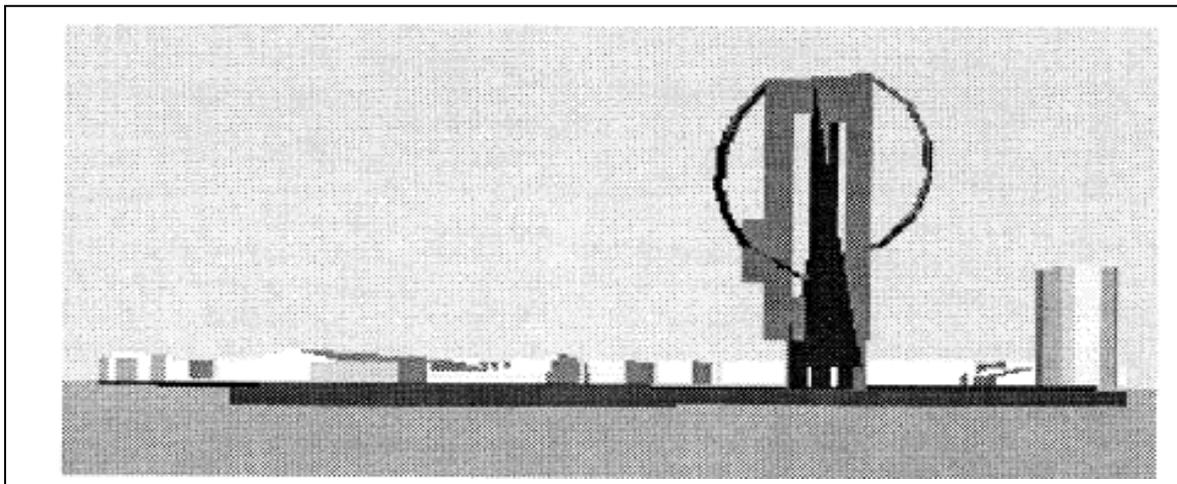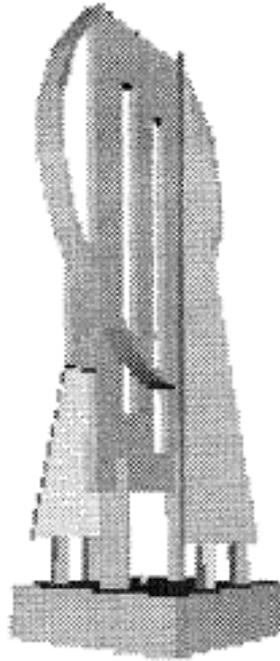
OBJECTIVE

We picked an assignment relating to Environment Impact Assessment (EIA) based on a real life situation which included a problem faced by the architects employed by the local authorities of Copenhagen.

In connection with the status of Copenhagen as City of Culture in 1996 a group of investors are planning to make a gift to Copenhagen of a monumental sculpture by the world-famed sculptor Robert Jacobsen. The sculpture was to be placed somewhere in the harbour of Copenhagen and serve as a kind of "landmark" for the city in the same way as the Little Mermaid has done for close to a hundred years now, although with a totally different historical and cultural foundation - and of course on quite a different scale.

Before his death Robert Jacobsen had created this monumental sculpture and had produced a model of the sculpture which in its final version was to be executed as an approximately 60 metre

high and 30 metre wide sculpture.

Under both Danish law and in pursuance of an EC directive a project of this dimension calls for a special assessment procedure (an EIA), which among other things involves the hearing of the general public. The students thus had to provide the groundwork for such an assessment and prepare an introduction for the public debate. The students not only had to offer an assessment of the proposed localization, but also suggest any alternative sites they found suitable.

METHODS

The method chosen was simple. The students were to construct a spatial digital model of the sculpture and a model of the Copenhagen docks with the surrounding city.

By combining the two models the students were to test a number of proposals for alternative locations of the sculpture.

Finally, the students were asked to test different kinds of presentation forms which might be suitable for the broad public debate.

The models of the dock area and the sculpture were of course to be used for the production of illustrations for the final assessment and presentation of the project, but more important, the work involved in constructing the models was supposed to make the students more aware of important sculptural and urban architectural facets of the harbour and the sculpture. In other words, the point was to make them use the construction of the digital model as a regular piece of analytical work as expressed by the saying, **'to learn to draw is to learn to see'**.
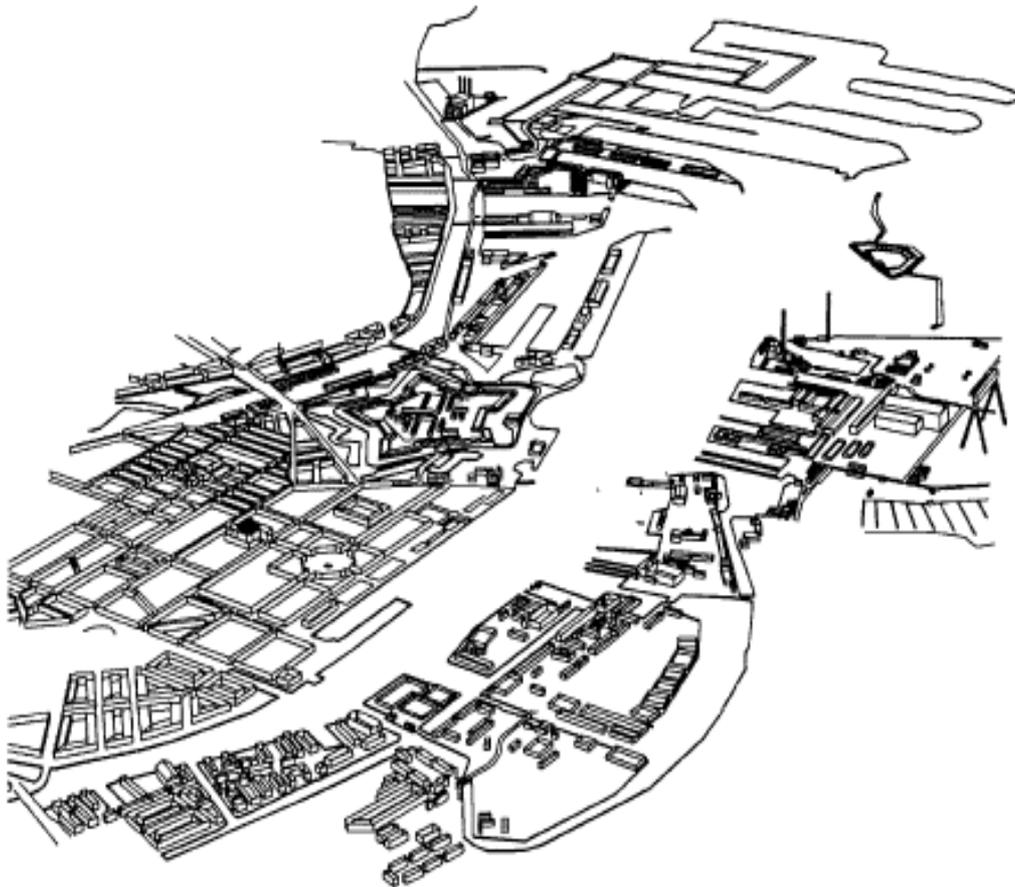
IMPLEMENTATION

Before the work on the construction of the 3D-model of the docks the students were offered a lecture on the harbour and a sail round the dock area. The purpose was to give the students insight into the history of the harbour's creation and the different facets of the docks in terms of use, interaction with the city and the sea, architecture, scale, materials, etc.

For the construction of the model analogue maps of the harbour and the city were digitalized. The heights of the buildings were registered by means of a theodolite. From "strategically" chosen positions the students measured the angle to the buildings and blocks they wanted to draw in the model. The angles were then used for the automatic erection of the buildings on the digital map.

This procedure compelled the students to go and actually look at the harbour and the city and critically estimate which buildings were of importance to the profile of the city and so had to be drawn in the model. The way in which the elements of the city were chosen and "drawn" in the model was to reflect this critical observation. Some of the urban elements were presented in more detail than others, and some were only suggested in the form of eg. blocks or just in rough outline.
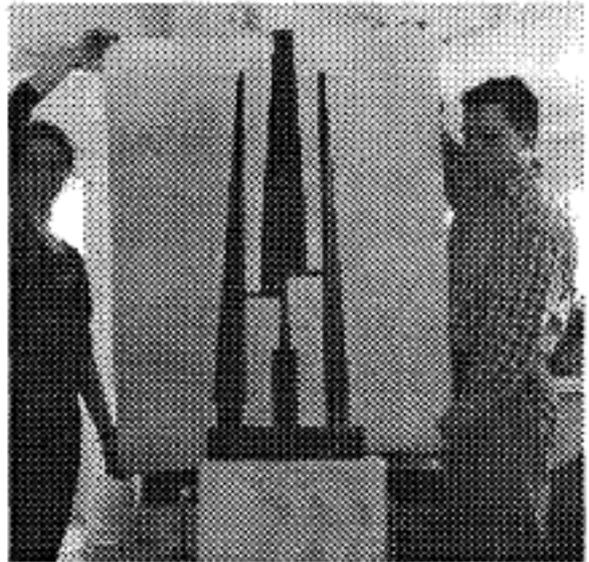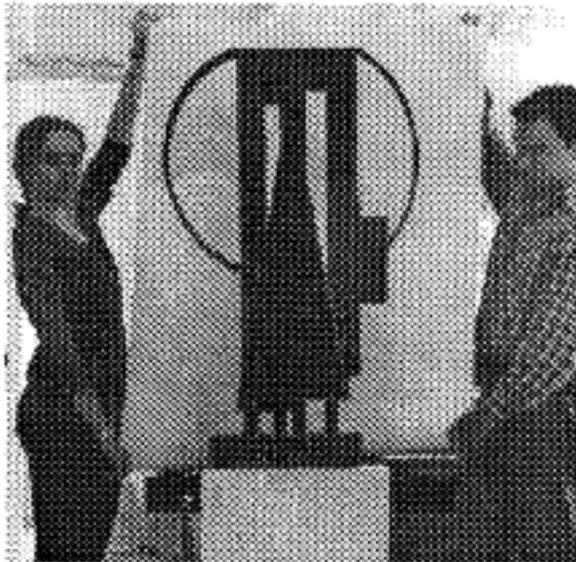
In connection with the digital model of the sculpture we elected to combine traditional methods of measurement with digitalizing of photographs. The most important points in the sculpture were measured on the spot. The photographs of the model were taken with angles that could correspond as precisely as possible to elevations (plan, front and sides). The photos were taken with a telephoto lens, so that they might, without too big a margin of error, be considered parallel projections.
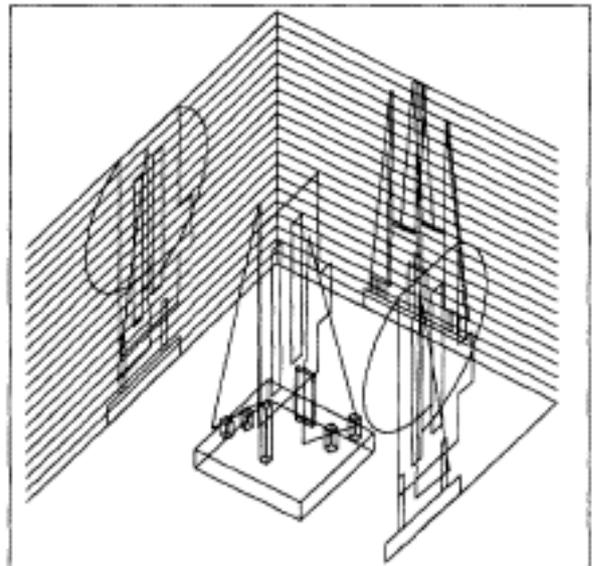
The photos were digitalized by means of a digitizer. The measurements were used for the calibration of the digitizer, allowing all digital drawings to have the same scale. The digitalized drawings were regarded as plan projections of the model, and were placed in CAD round a "construction room" in accordance with the photos. It was thus possible to construct the 3D-model directly by snapping the points of the various plan projections.
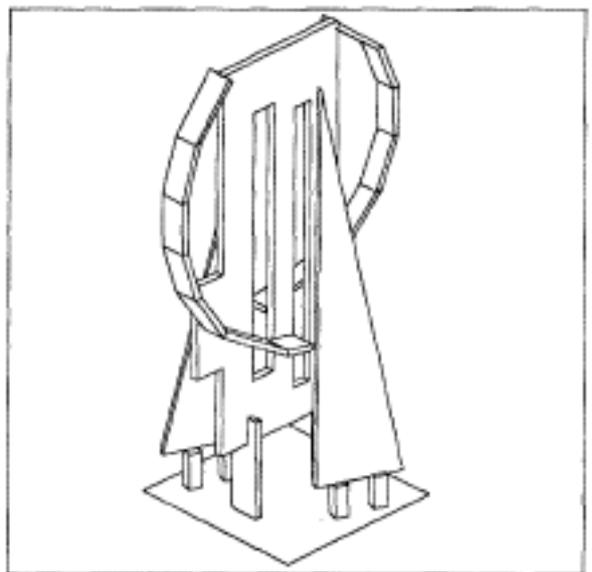
With this procedure the students could not help but see the many finer points of Robert Jacobsen's sculpture. It is thus possible to provide an analysis which might not have been feasible with the use of eg a 3D-digitizer.

of selected proposals were assessed against each other. Last the proposals selected were processed for the final presentation.

Most of the students arrived at the same conclusion. The best thing would be to place the sculpture away from other urban elements, and preferably in the outer docks, ie by the entry to the harbour where the urban architecture may be characterized as open with low and detached buildings.

With this analysis the students arrived at a conclusion which is in accordance with the ideas that Robert Jacobsen had when he created the sculpture, the sculpture was to stand out as both a navigation mark and a landmark joining together the sea and the city, ie. a sculptural symbol for the harbour which is the link between the city of Copenhagen and the sea.

RESULTS

With the digital models of the harbour and the sculpture each individual student could test different alternative localizations. First, many proposals were tested and independently assessed. Then a number
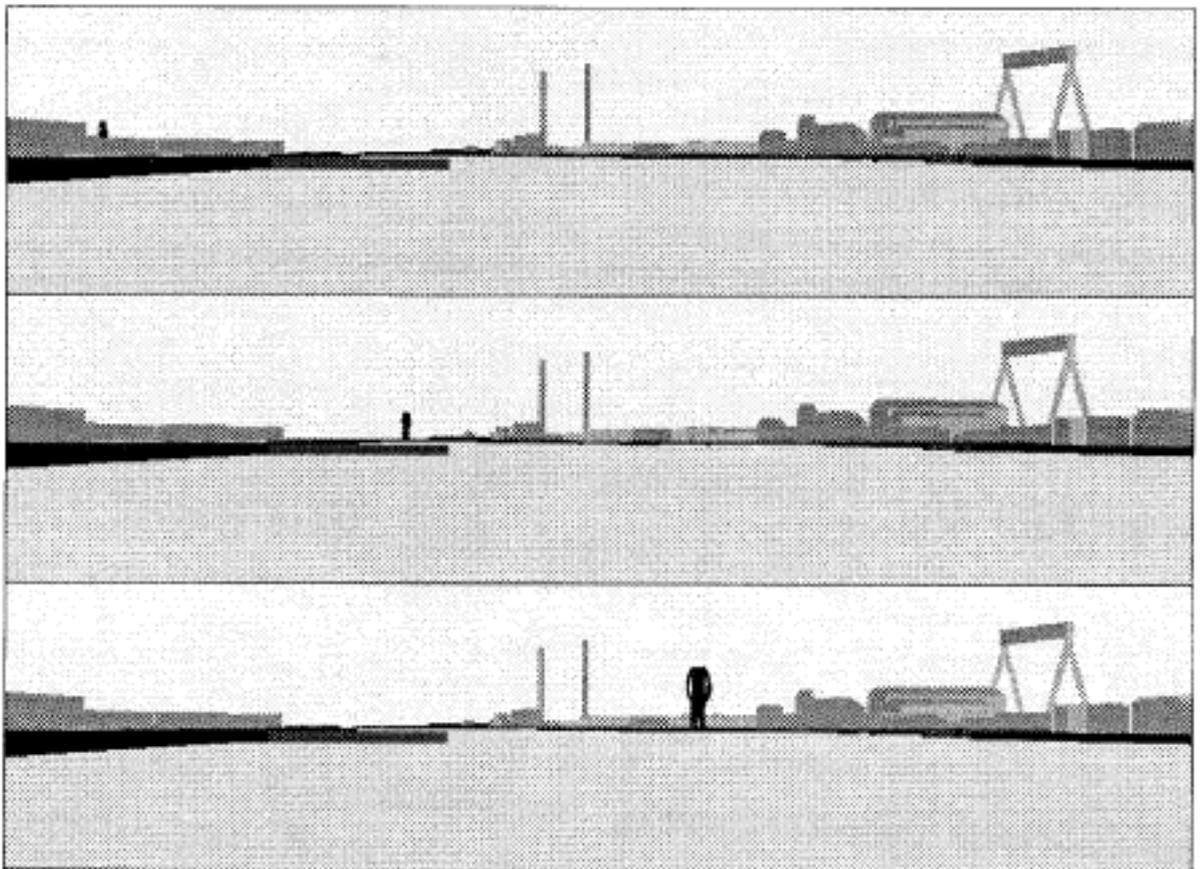
EXPERIENCE

In the workshop we succeeded in demystifying CAAD by containing CAAD and restricting it to the level where it belongs, ie. as one of the many tools used by architects for the analysis and expression of architectural interactions and intentions.

The objective of our CAAD instruction is not to advertise the latest novelties put on the market by the computer industry, but to teach the students to control the medium, ie. to make it their tool. The key word in connection with CAAD instruction is: use.

One way to achieve this goal is to allow the choice of the computer techniques that are to be used for the solution of a

particular problem to be determined by the professional objective and method of the assignment and by the students' professional and computer background.

That these goals were reached in the workshop can be seen from the students' critical attitude towards computer technology as was evident during the assessment phase. As they put it themselves, they were not impressed by CAAD, but no-one denied that this tool had been a great help in the solution of the problem, and all were certain that in the future they would be using CAAD when working on their assignments.

The workshop had thus been a small step in the right direction, viz. in the direction towards a normalization of the use of computers in the training of architects.
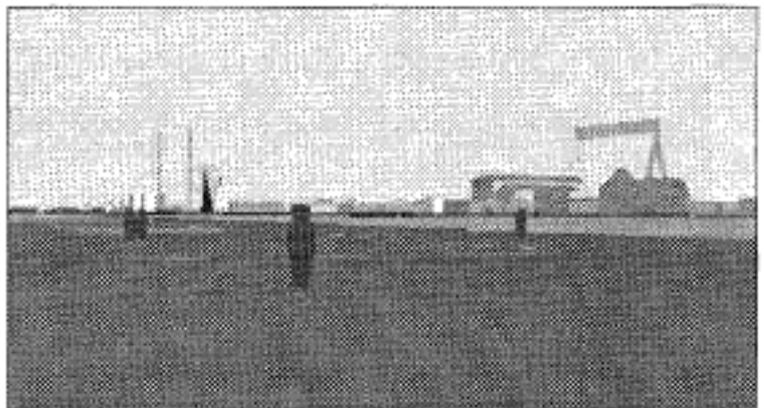
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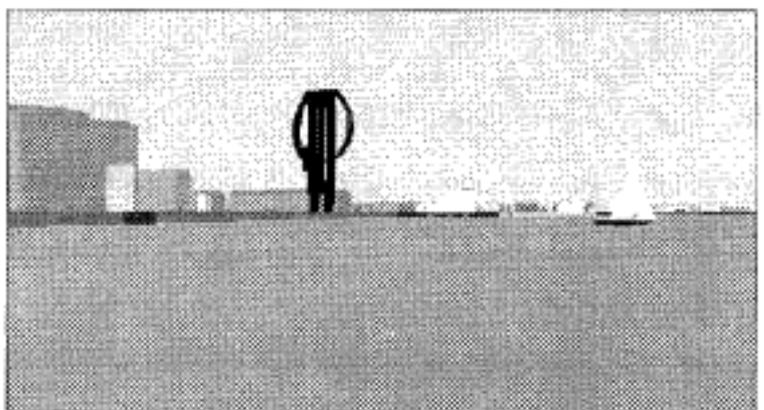
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