

## CAAD in the transformability evaluation of historical buildings

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*In the execution of a research, which was intended to identify 'Methods and instruments for transformability evaluation of historical buildings': CAAD was usefully employed in the decision-making process at different levels.*

*From an operative point of view, it was fundamental instruments for the acquisition of typomorphological data inherent to pre-existent buildings. It allowed us to create an archive of information which can be easily and flexibly up-dated. Infact the critical evaluation of these buildings is based on the identification of structural patterns which have characterized the typological evolution of the urban structure, and thus the different historical stratifications have to be carefully catalogued, profoundly analyzed and compared one with the other.*

*CAAD was even more effective during the phase of meta-designing checking concerning the choices effected for conversion of old buildings, since it was possible to prefigure different scenarios according to formulated hypotheses and this gave us the opportunity to evaluate their effective practicability in relation to typo-morphological congruence and logical and formal connection between the old building and new design proposals.*

*An example is hereunder illustrate: the old "V. Chiarugi" Hospital in Florence.*

### GENERAL AIMS

In the architectural departments as well as in the professional practice, CAAD is often used just as a drawing tool. This is surely a limitation of the possibilities of CAAD that is usually remarked by diffusion of "shining" and sophisticated commercial software.

On the contrary for educational purpose we should stimulate the students to use simple but wellknown tools. In other words students should learn to understand first the whole possibilities of basic software and above all learn as applicate and use it for best design method purpose.

A quick and deep analysis and clear and meaningful synthesis, should be the main aims to reach an useful application of CAAD to design methods.

### APPLICATION IN THE TRANSFORMABILITY EVALUATION OF HISTORICAL BUILDINGS

The transformability of historical building is a basic problem from both theoretical an practical points of view. Approaching the reuse of old buildings, it is fundamental to evaluate the possibilities of a different use from the original one and improving both formal and functional quality standards. Of course this evaluation is possible only according with existing situation of the building we are dealing with.

The transformability method concerns the steps just before designing. In fact for a correct evaluation and then proper design, there are two steps of working:

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of the formal web of the building fronts. These data represented the basic factors for the following steps of the rehabilitation design.

ABACO DEI TIPI DI PADIGLIONE ED INDIVIDUAZIONE DELLE GRIGLIE GENERATRICI				
	PIANTA PIANO TERRA	GRIGLIE GEOMETRICHE <i>funzionali/strutturali</i>	PROSPETTO FRONTALE	GRIGLIE GEOMETRICHE <i>formali</i>
PADIGLIONE 1				
PADIGLIONE 2-3				
PADIGLIONE 4				
PADIGLIONE 5				
PADIGLIONE 6				
PADIGLIONE 7				
PADIGLIONE 8				
PADIGLIONE 9				

The possibilities of reuse were formulated on basis of the real emerged needs in the analysis of urban and social context where the old hospital is located.

Then the organizing and functional schemes of rooms related to the new models of use were compared with ones previously individuated in the several wards. This operation was possible with CAAD tools, overlapping some layers containing different kind of graphic information, and enabled a preliminary evaluation of compatibility between the originary models of use and the new ones.

Besides the study turned its attention to the transformation of the existent buildings by the addition of new ones, and their mutual interaction. We can consider the question from two angles: the prefiguration of new architectonic spaces, and the relations between old and new formal language.

In the first case the 3D modelling was essential to evaluate the new architectonic compositions, especially directed on the change of the hard originary hierarchy of the hospital plan. The axial symmetry with central polarity was subverted by a different balancing of architectonic volumes, generating schemes quite or partly different from originary ones: distribution of new volumes by the side of longitudinal axis, peripheral displacement of functional nucleus, etc. New arrangements of rooms were tested related to different building typology such as "patio", and new networks of paths were defined.

In the second case we proceeded to individuate the compositive modules of the facades with scanning process of front unit photoes for every ward. An easy management of these raster images made possible to design assonant formal solutions for the new buildings with originary ones.

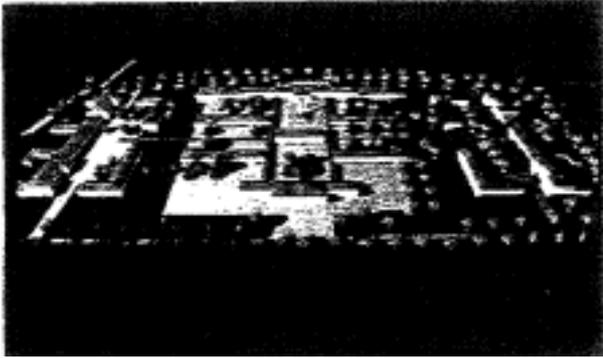
From a methodological point of view graphic computing processes were essential to recognize the compositive rules of the old hospital design, and to get critical opinions about the possibility to repropose or to refuse that kind of approach.

## CONCLUSIONS

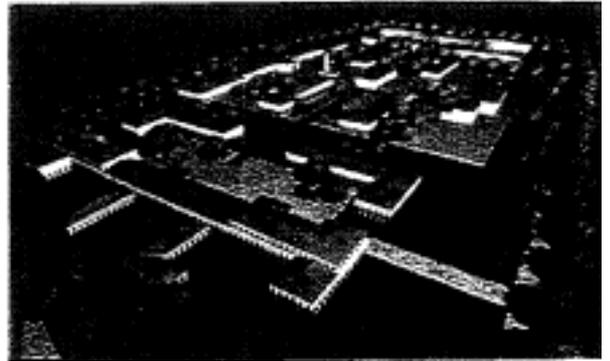
This experience allow us to summarize these conclusions.

- The progress from the archive, to the drawing, to the scanning of photoes, to the creation of models, to the comparison of schemes till the perspective volumetric evaluation is bouth natural step by step program of practice in CAAD and rational approach to design from analysis to the proposals.
- In addition it is interesting to mark that in this way the students develop at the same time their own personal skills and the group ones.
- As last evaluation for teaching staff is possible to have an easy-to-consult archive of teaching methods and results that allow to judge every year the work developed and to improve it by the critical comparison with ones of the previous years.

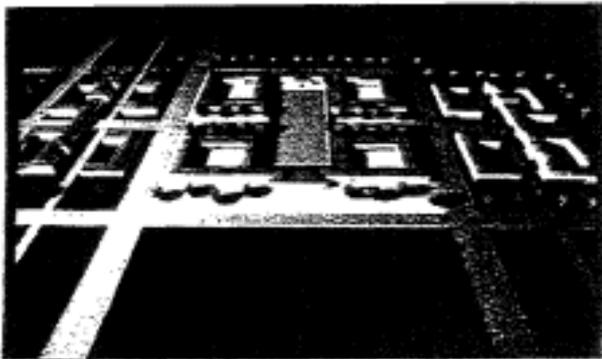
*Fig. 1 - Abacus of the ward types: grids of functional, static and formal features.*



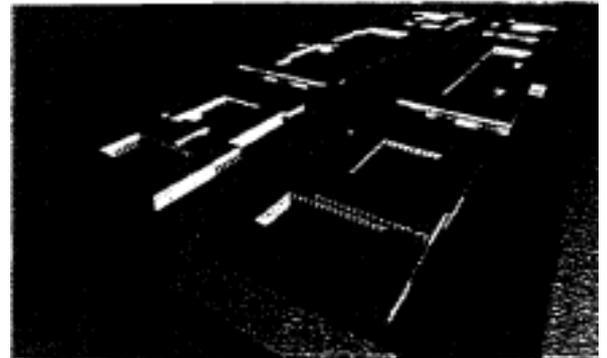
*Fig. 2 - 3D modelling of the hospital*



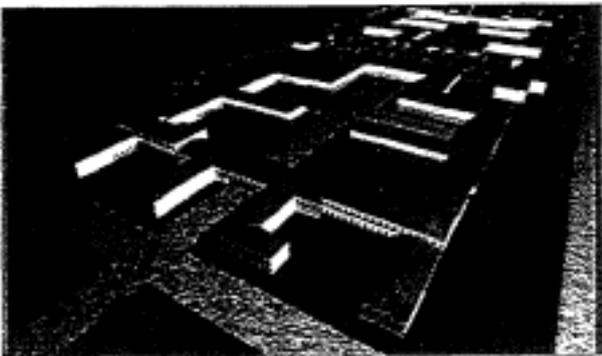
*Fig. 3 - Perspective view*



*Fig. 4 - Transformation A*



*Fig. 5 - Transformation B*



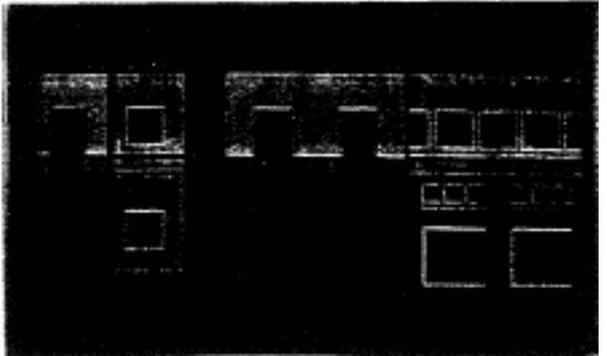
*Fig. 6 - Transformation C*



*Fig. 7 - Transformation D*



*Fig. 8 - Compositive modules of facades*



*Fig. 9 - A new assonant formal solution*

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