

CAAD: Education-Research and Practice
ECAADE Conference 1989
School of Architecture in Aarhus, Denmark

CAAD AT THE TECHNICAL UNIVERSITY OF MUNICH FEATURES OF EDUCATION AND RESEARCH

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1. General Notes:

The educational outlines used by the German, and most other European schools of architecture, have certain differences in comparison to an American school. This is partly due to the different tasks each group has to fulfill.

Our architects not only plan their projects in detail, but in many cases they have to supervise the site as well. Most importantly, they also check on all communications between those participating in the design process.

Skills of architects leaving their schools and entering into practical life generally need further training. Since CAAD is becoming more and more involved in architectural design studios of various sizes, the development of skills in this area should be shifted towards the period of studies. Thus, schools and staffs have to react to meet the needs of the present facts.

2. Present Situation:

Focusing on the European, and here on the German situation, we note that the architect-group's interest in using computers has been steadily growing. Architects have believed long enough that they are threatened, instead of aided, by the machine. Today, many examples exist of computer-assisted projects showing a remarkable reduction of planning and detailing mistakes. Through numeric and graphic computer-data exchange, planning participants can communicate with each other.

Students practicing in computer-assisted design-studios have found that there will be an increasing need for CAAD-skills by the time they will be entering the job market.

Table 1 : Number of Students

Technical University	- total: 23800	beginners: 3920 p.a.
Dept. of Architecture	- total: 1348	beginners: 224 p.a.
Students of Architecture		
attending CAAD-subjects	- hearing: 120	completing: 40

In order to cover the resulting needs, the schools are called to provide the equipment and the teaching staff. In regard to equipment, the government provides financial help. But there is a lack of support for personal and areal development.

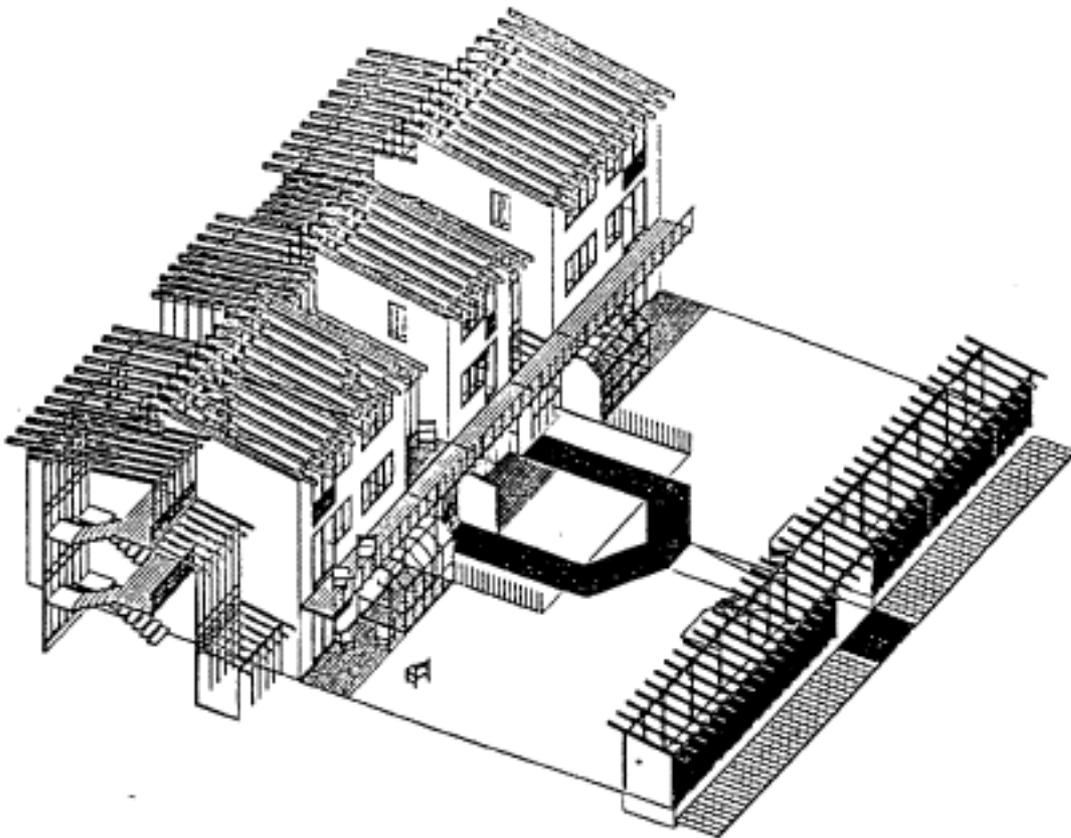
The following figures can give an idea of the equipment installed and the limited size of the staff involved with the subject.

Table 2 : Hardware - Equipment

12	PCS-Workstations	CADMUS 9600
7	HP-Workstations	9000/300
6	COMPAQ-PCs	386-16 (resp. other IBM-Compatibles)
8	COMPAQ-PCs	386-25 (end of 1989)

Table 3 : Staff concerned with CAAD-subjects

1	faculty member	full time
1	faculty member	half time
2	faculty members	occasionally
8	student lecturers	10 hours/week



drawn by Joachim Leppert

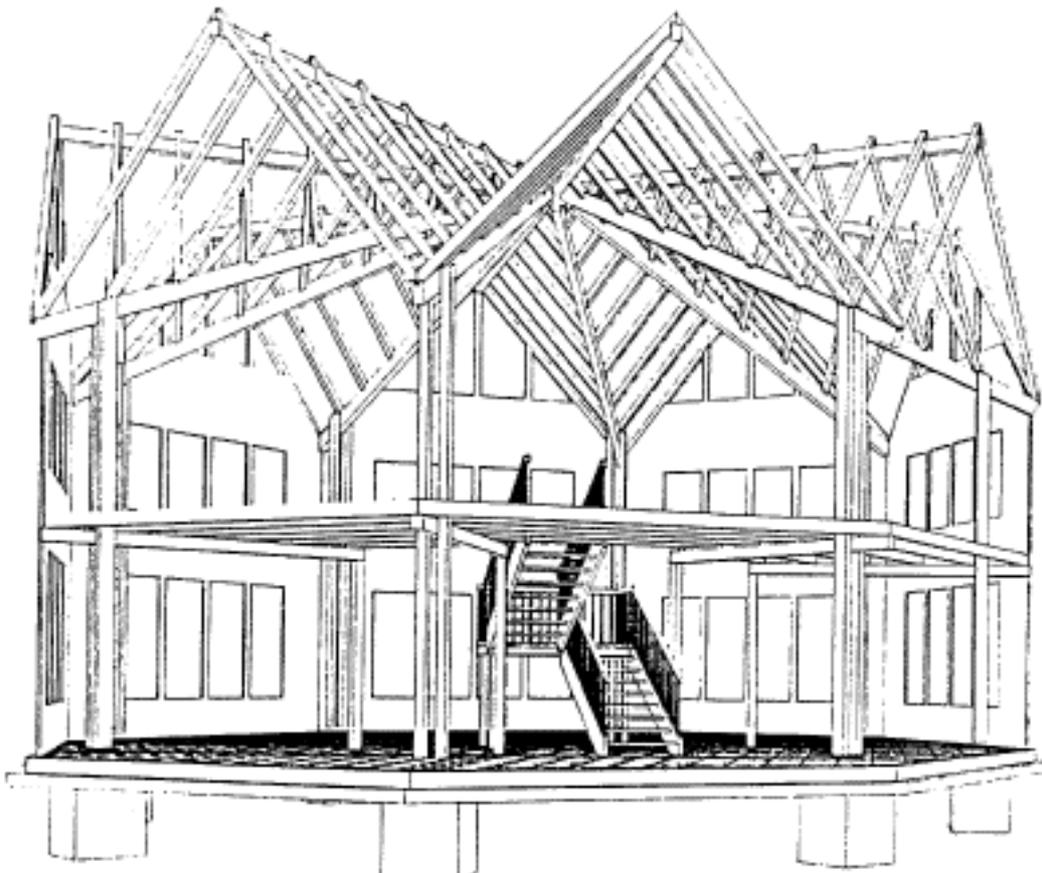
3. Teaching Concept

The outlines of our CAAD-education have developed from a history of 15 years of existence. The particular structure of the educational concept is in constant motion, following narrowly the needs and actual circumstances; table 4 can only show a temporary status.

Table 4: Lectures - Overview

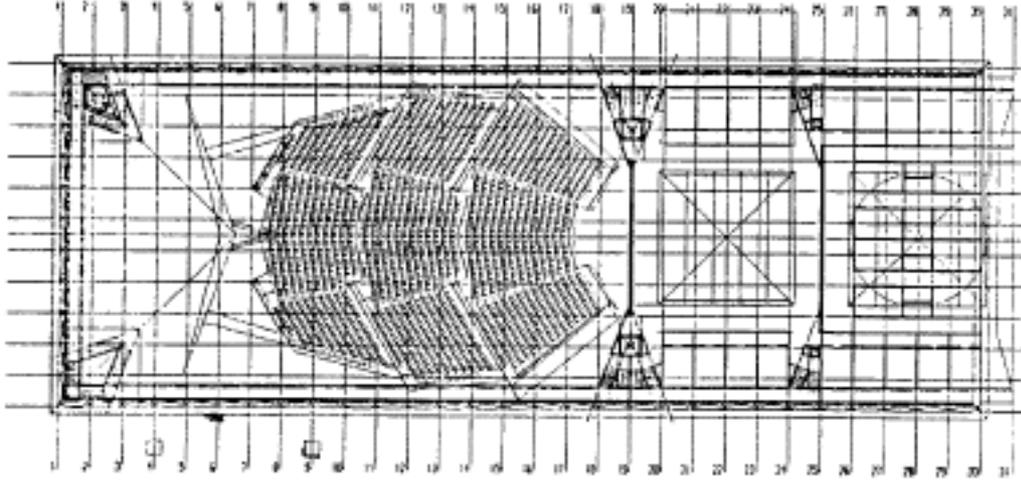
- 1 Introduction into Data-Processing
- 2 Introduction into Operating Systems (MS-DOS, UNIX)
- 3 CAAD - Basics for Architects
- 4 CAAD - Applications on Personal Computers
- 5 CAAD - Applications on Workstation-Concepts
- 6 Courses on AutoLISP and MODULA II
- 7 Programming of Advanced Languages (PASCAL, C)
- 8 Basics of Computer Graphics Programming
- 9 Applications of Modern Methods (Expert Systems)

Considering the fact that the students of today will have to face a future working environment that will be assisted by totally different CAAD-systems it is very important that the schools are aware of the developments in this area.



drawn by Thomas Büchele

In our opinion it is very important to prepare the students in the best possible practice-oriented way by offering them CAAD-systems with satisfying efficiency and easy access as assistance for their studies and design-projects. They should know how modern CAAD-systems are able to perform and they should achieve a good sense for future developments.



drawn by Volker Heid

We are convinced of the usefulness of a rather pragmatic approach. It is not enough that students know how to use a CAAD-system in rough outlines but they have to arrive at a considerable skill in this field. Only then, as we have seen in numerous examples, students try to use CAAD-systems also in early stages of design.



drawn by Volker Heid

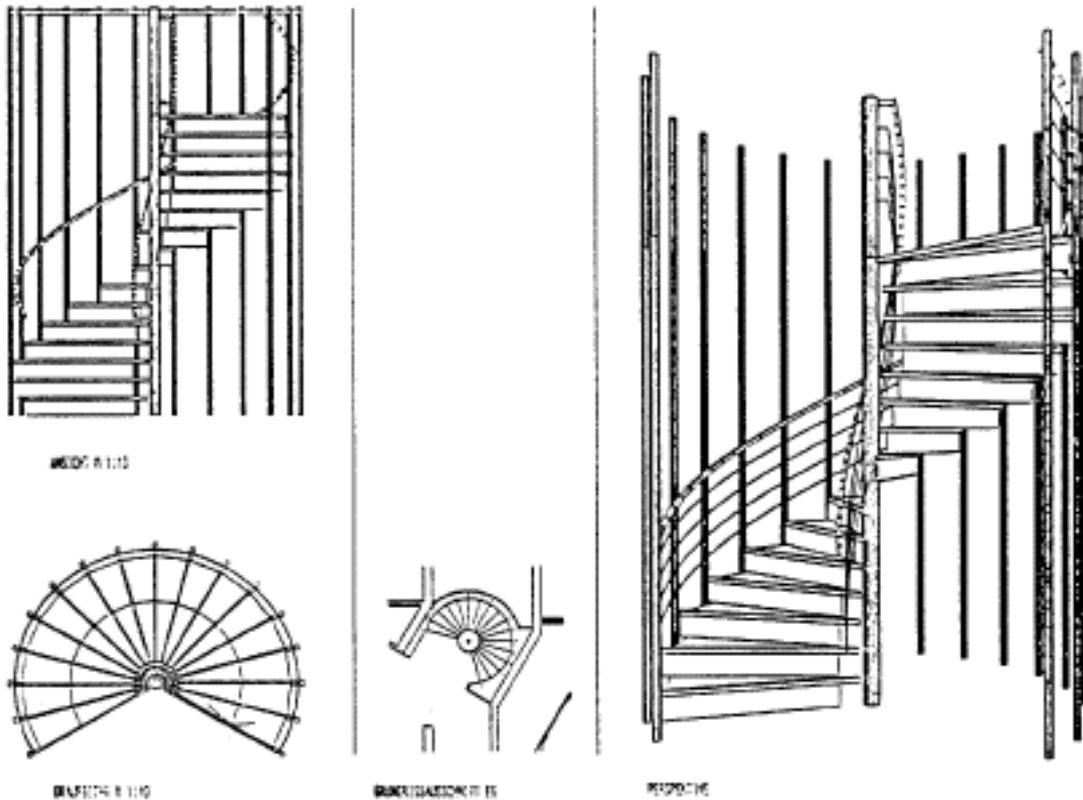
4. Research Concept

Modern methods such as Artificial Intelligence and Expert Systems will possibly be offering an entirely new access to CAAD-applications. The schools will have to follow these developments and, even better, should try to exert influence by own research results, keeping in mind the narrow touch to the practical needs.

Table 3 : Some Topics of Research

- 1 Problems of Interfacing between CAAD-Systems
- 2 Improvement of User-Interfaces
- 3 Application of AI-methods to selected problems

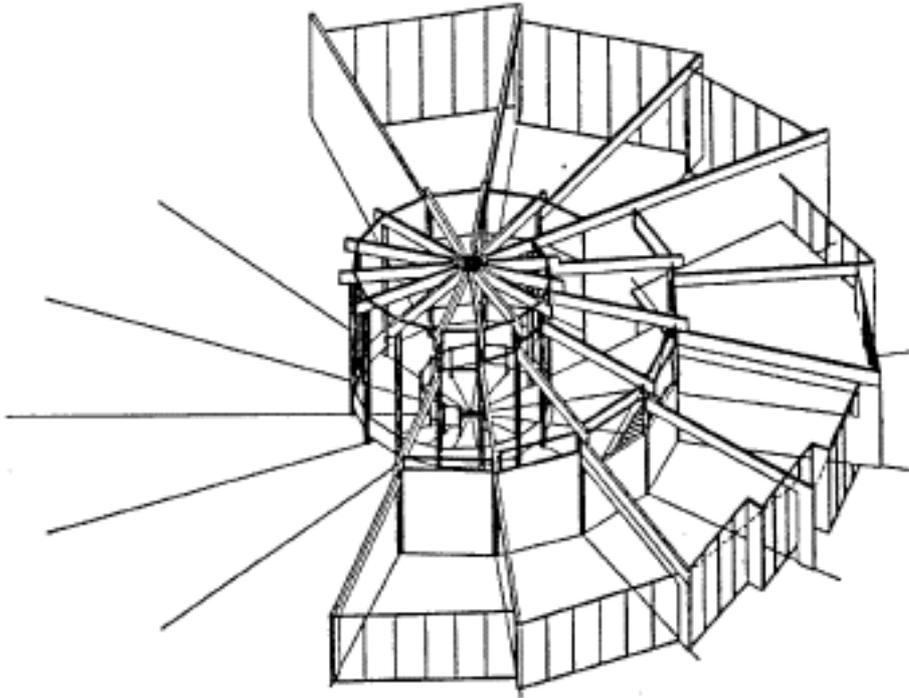
There have been positive examples that research activities produce an immediate impact on the educational process. Students are introduced into some features of Artificial Intelligence, thus getting a hold on the operational basics of these entirely new methods. In small groups of specially interested students we shall try to work on small expert systems, bearing in mind to connect the results.



drawn by Joachim Leppert

5. Summary

Considering different ways of educating CAAD we think that the pragmatic approach will bring the best results. Only those students having worked hard to achieve outstanding skills will be introduced to experiments and research activities. The results of these activities will produce an impact on education again and may have a considerable influence on further developments.



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