

## Teaching Membrane Architecture

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### Abstract

In the year 2010 the postgraduate Master's Program for "Tensile Membrane Structures" was initiated in Vienna Austria. Since then positive improvements have been made to provide a pleasant and efficient learning environment.

In 2018 it was possible to enrich the existing curriculum with a collaborative researching and learning method. The basis of this method is a massive amount of content which was provided by experts in the field like Dr. Rainer Blum, Architect Horst Dürr or Prof. Vinzenz Sedlak. The content of these authors is pending for publication but already integrated in a semantic database. Although the amount of information is growing constantly it was possible to keep the access simple and effective. The process to structure and classify relevant information is to make "clever" annotations to each bit of information. So the annotation helps the researcher gain a better view on the available data. It should be possible to share learning's and valuable findings with colleagues and the scientific community. One major goal of this system is to connect experts and researchers with a constantly improved research environment which is pleasant to use an inspiring. As the method is about the visualization and communication of expertise we structured the work in several fields of interest. To mention one pivot point we focus on case studies of existing building projects. The collection of several hundred case studies was used to create a semantic database. Case studies are individually presented including a full digital 3D model that can be addressed online. Each 3D model was described throughout automated object recognition in respect to the geometric properties. Therefore a kind of 3D fingerprint is generated to compare eg. performance parameters. Throughout annotations by researchers the 3D models get more and more information. This process helps to recognize several aspects of a building project. The system is also open to bind other useful information to performance parameters. As we developed with the Danube University Krems a full climate membrane building envelope it is possible to share this information with other researchers when the performance power of one specific project is higher than others. It is a kind of alert system which keeps researchers updated when new knowledge or findings are made.

Based on the semantic database we intend to establish a future "ontology" of membrane architecture. The term ontology describes that it needs a common sense in the scientific world to define and describe parameters. The goal of this system is to provide access to relevant knowledge and to bind together a team of experts and researchers to make membrane architecture better.

### References

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