

Materials Science and Materials Chemistry

August 20-21, 2018 | Paris, France

Platform of tools (AI) to facilitate biomimetic design process in architecture domain

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The project aims to develop an innovative practice of architectural design towards sustainability based on biomimetic approach. Biomimetic architectural design is a difficult activity to implement. Nature presents such a multitude of phenomena that the time of research and maturation of a possible transfer to architecture is necessarily very long and it requires a strong collaboration between biologists and architects. This type of multidisciplinary activity is still not directly applicable in the time and activity of an architectural project neither in its economic and social context. To develop sustainable innovation through biomimetic approach in the sector of architecture and urbanism different levers are identifiable. One of the levers would be to set up a platform of exchange and interdisciplinary cooperation between architects and biologists. The platform would also provide architects along with support tools for the biomimetic design process. To develop the platform we envisage to:

1. Constructing Ontology (AI) for biomimetic architecture


knowledge, the ontology helps to bridge the biological knowledge and architectural concept.

2. Developing a decision-making tool (BN) to select the most appropriate strategies within the ontology of biomimetic architecture knowledge according to the characteristics of the project and specific requirements (function, site, requirements in terms of energy saving etc.).
3. Experimenting and testing innovative tools, for example, TRIZ and CK for the biologically inspired design process in the framework of architectural projects carried out with students at ENSAPLV in workshop settings.

Speaker Biography

Natasha Heil has completed her Ph.D. in biomimetic strategy for design and innovation in architecture in 2012 from TUWien, Austria. She is an architect and a researcher at MAP-MAACC, CNRS-MCC UMR 3495, Paris, France. Her research focuses on the exploration of several innovative methods and digital tools to translate principles of nature and implement them in architectural design.

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