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# A Study for Metadata Structure and Recommender of Biological Systems to Support a Bio-inspired Design

RESEARCH HIGHLIGHTS

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Bio-inspired design is the design method encouraging breakthrough innovations by stimulating analogical reasoning of designers. However, most of the time, designers choose wrong metaphors to do the bio-inspired design. As long as they are novice in natural science, this problem cannot be solved. To resolve this problem, the recommendation system has been developed and evaluated. Specifically, the representation framework that stores biological characteristics of BSs at the holistic perspective of 'physical, biological, and ecological relations' is redesigned and the retrieval system that is operated on the representation framework is implemented for designers. The representation framework was complemented by the systematic indexing mechanisms and the causal model based ontology. This research could dramatically increase the solution space of designers and guide the designers to choose appropriate metaphor from the nature.


Fig. 1. Industrial Fields of Biomimicry and Its Design Cases

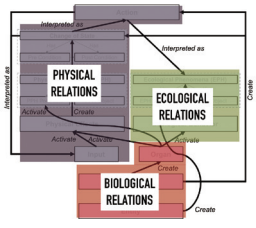


Fig. 2. Representation of the Biological Systems

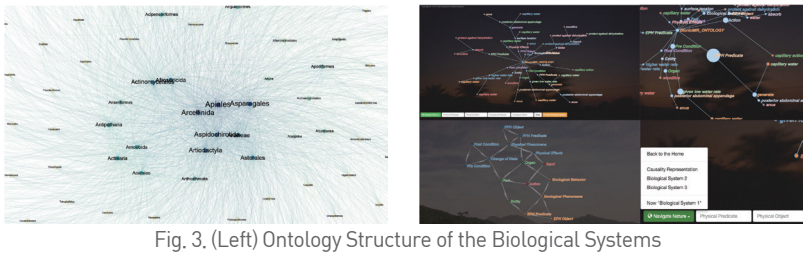

Fig. 3. (Left) Ontology Structure of the Biological Systems
(Right) Implementation of the Recommender

References
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• Kim, S.–J. and Lee, J.–H. (2014). Parametric shape modification and application in a morphological biomimetic design. Advanced Engineering Informatics 29(1), pp. 76–86. SCIE