

Journal of Mechanical Design

Special Issue 2014: Biologically-Inspired Design

Biologically-inspired design (BID) (or biomimicry) is an emerging research area at the intersection of design, computer science and biology that seeks to systematically mine biological knowledge to solve design problems. BID research is active across many disciplines and has had important and significant results. Of particular research interest to society is how can we mine biology for solutions to problems for which we have no good “engineered” solution (e.g., think of how Velcro changed the world as a means of easy, reusable attachments – it was inspired by the common cocklebur’s hooked spines that easily grab other objects). Consequently, the *Journal of Mechanical Design* calls for submissions for a special issue on Biologically-Inspired Design. Topics can include, but are not limited to the following:

- BID system usability, interface design, visualization, and search;
- Identification of the role of BID tools and design methods for each stage of design process, e.g., problem framing, conceptual design, refinement, production (DfM for BID), marketing, re-use/recycle;
- Knowledge-base/data-base building and integration, ontologies (construction, use and evaluation) and testbeds (computational and physical);
- Evaluation of analogy utility (before, after and during use) during BID use, and manufacturability of resulting designs;
- Roles of scales (both spatial – from micro to macro to systems of systems – and temporal – to promote desired emergent behavior over time) of biological knowledge for problem identification, design decomposition, generation, evaluation and explanation;
- Impact of BID on communication in multiple disciplinary teams, e.g., novice-expert studies, development of a community of practice and networks, sociology of disciplinary norms;
- Teaching approaches and curricular development.

The special issue also welcomes papers that closely examine the theoretical foundations of the various existing approaches and their relative merits. While application areas are not limited to a specific domain of interest, we encourage submissions that have much potential to solve urgent and complex challenges faced by persons and planet such as those found in military, urban infrastructures, climate change, sustainability and space exploration domains. Although the inclusion of a design case study is not mandatory, the design context under which the methods can be used needs to be clearly stated in all submissions — relevance to engineering design will be explicitly considered as a criterion in the review process.

Submission Instructions

Please submit your paper to ASME at <http://journaltool.asme.org> and note on the cover page that your paper is intended for the special issue on “Biologically-Inspired Design”. Please also send an email to editor@asmejmd.org to alert the editor that your paper is intended for the special issue. Journal-quality BID papers submitted to the ASME International Design Engineering Technical Conferences (IDETC) are also eligible for submission to this Special Issue, though the review processes are separate. Information about the *Journal of Mechanical Design* can be found at <http://asmejmd.org>. Please note that a limit of 12 journal pages without ASME page fees will be observed.

Publication Target Dates

Authors submit papers by: January 15, 2014

Initial review completed by: March 15, 2014

Publication of special issue by: November 2014

Papers submitted by January 15, 2014 will be reviewed in time for inclusion in the special issue. Papers received after that date will still be considered for the special issue, if time and space permits. Otherwise, accepted papers will appear in a later issue of the journal.

Special Issue Editors

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