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Special Issue on Emerging Technologies and Methods for Early-Stage Product Design and Development

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ASME *Journal of Mechanical Design*

Special Issue on Emerging Technologies and Methods for Early-Stage Product Design and Development

Emerging technologies such as artificial intelligence/machine learning (AI/ML), augmented/virtual/mixed reality (AR/VR/MR), and cloud computing have the potential to greatly impact the activities, output, and performance of the early stages of product design and development (PDD). Most current work on applied new technologies is focused on the detailed design phases of PDD. Understanding user needs, conceptual design, and development of systems architecture are all aspects of the front-end of PDD that will be impacted by these new tools and methods.

This Special Issue calls for research to dive more deeply into these topics of interest. The motivation stems from the large number of emerging technologies and methods that are responsive to the growth of user-generated data and other contemporary opportunities. New methods powered by emerging technologies (e.g., generative design, natural language processing, cloud-based virtual collaboration, immersive interfaces, spatial computing) introduce new opportunities to support, augment, and enhance activities associated with the early stages of PDD, from eliciting customer sentiment to developing novel design concepts. This Special Issue will report state-of-the-art emerging technologies and methods in all phases of early-stage PDD.

Topic Areas
The following is a non-comprehensive list of representative topics within scope of this Special Issue.
- AI/ML techniques for navigating the fuzzy front-end, large-scale need finding, experience mapping, and opportunity space investigation
- New rapid prototyping technologies and their roles in user needs exploration
- AR/VR/MR for virtual prototyping, design, testing, and immersive remote collaboration
- Emerging tools and applications of computer-aided design, digital models, virtual testing, and rapid prototypes
- Data-driven methods for automated design generation, testing, and evaluation
- Emerging methods for aesthetic development, design language exploration, and graphic/industrial design
- Subsystem, systems architecture, and model-based systems engineering (MBSE) development
- Crowdsourcing and design-orientated digital platforms for distributed and virtual collaboration in PDD
- Democratization, fairness, inclusion, bias, and ethics in emerging PDD technologies and methods
- Security, privacy, and intellectual property concerns in PDD
- Innovative practices and contemporary challenges in early-stage PDD education and technology-enabled teaching and learning of conceptual design

Publication Target Dates
Paper submission deadline	**July 1, 2022**
Initial review completed	**September 15, 2022**
Final decision	**December 1, 2022**
Special Issue publication date	**March 2023**

Submission Instructions
Papers should be submitted electronically to the journal at **journaltool.asme.org**. If you already have an account, log in as author and select **Submit Paper** at the bottom of the page. If you do not have an account, select **Submissions** and follow the steps. In either case, at the **Paper Submittal** page, select the **ASME *Journal of Mechanical Design*** and then select the Special Issue **Emerging Technologies and Methods for Early-Stage Product Design and Development.**

Papers received after July 1, 2022, may still be considered for the Special Issue, if time and space permits. Early submissions to this Special Issue once accepted will be published online first.

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