



Editorial

Journal of Manufacturing Science and Engineering (JMSE) welcomes Position Papers from manufacturing science and engineering thought leaders. The position paper points to a new frontier research direction for simple and innovative thinking and provides examples and a roadmap for manufacturing research. A position paper aims to inspire our manufacturing research community by sharing novel and bold ideas to address national and global challenges for long-lasting impacts.

In this issue, we are delighted to publish a position paper by Malshe, Bapat, and Fischer on “[Understanding Frugal Engineering for Equity: Exploring Convergence of Biological Designs and Social Innovations](#).” Against the backdrop of years of advanced manufacturing R&D, multiple global trends and drivers have resulted in a steep escalation of tech-socio-economic inequities in basic human needs across industrialized as well as industrializing nations. This escalation is paralleled by the growing trend of novel and simple frugal innovations for meeting basic human needs, which are applied across various communities in the world toward bridging gaps of inequity. “Frugality” in this context is defined as minimizing the use of capital resources while delivering effective manufacturing product outcomes. It is noteworthy that frugal innovations are abundantly observed in the biological designs in nature. This position paper is aimed at understanding the methodology of frugal engineering behind the resulting

frugal manufacturing innovations through discovering the cross section of frameworks of biological designs in nature and equitable social innovations. Authors have applied the framework of biological designs as these designs are observed to deliver multifunctionality, resilience, and sustainability, which are key to a frugal and equitable innovation platform and achieved by the frugal engineering process.

In 2008, a position paper on “[Biomedical Manufacturing: A New Frontier of Manufacturing Research](#)” introduced our community to a rich, new frontier of manufacturing research area with healthcare. Advanced manufacturing technologies, such as manufacturing processes, systems, and quality control, can be readily applied to improve the safety, quality, cost, efficiency, and speed of healthcare service and biomedical research. There is a biomanufacturing technical track created under the manufacturing engineering division (MED) and symposia for the exchange of research findings at the Manufacturing Science and Engineering Conference (MSEC).

We want to encourage leaders of our manufacturing community, particularly those forward thinkers at the cusp of a new field, to write position papers for JMSE. We envision these position papers will spark new research in fundamentals of frugal engineering methodologies and equitable manufacturing and facilitate agility of manufacturing discipline to benefit society and deliver tech-socio-economic equity.



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