— Call for Abstracts —

Gamechanging Ideas for Cost-Effective Low-Volume Manufacturing

Sponsored by MForesight: Alliance for Manufacturing Foresight

MForesight is sponsoring a workshop to be held at the ASME International Manufacturing Science and Engineering Conference (MSEC). This Gamechangers Workshop will offer an opportunity for researchers and innovators to present manufacturing process innovations that enable cost-effective low-volume manufacturing in the U.S. MForesight is seeking innovations in hardware and software to enable entrepreneurs to transition from makers to low-volume manufacturers.

Advances in 3D printing enabled individual inventors and entrepreneurs to make high value personalized products in the quantities of one or tens. On the other hand, in traditional high-volume manufacturing of commodity products, the unit cost is very low since the initial investment in high cost dies/molds is amortized over hundreds of thousands or even millions of units. Between these two extremes, there are opportunities and challenges to **manufacture** products in low volumes, say between 1,000 and 10,000 units. Such volumes may be too large to "print" or "machine" one at a time and such quantities are too small to justify investment in expensive production tooling.

Low-volume manufacturing, at small-lot sizes of 1,000-10,000 units of innovative and specialized products at economical pricing is needed in nearly every industry, from medical devices to defense to consumer products. One of the goals is to broaden capabilities and access to small volume manufacturing as widely as possible. Cost-competitive manufacturing at small-lot sizes is essential to increase the variety and value of what an individual or small team can create. The challenge for low-volume manufacturing remains in creating technologies that have a low enough initial investment and additional per unit cost that the overall cost/unit is competitive with mass production. Examples of potential technologies include but are not limited to:
a. Technology for reconfigurable dies and molds (zero tooling cost)
b. Technology for massively parallel additive manufacturing methods, where entire layers or large regions are formed at once, rather than point by point
c. Technology to substantially lower die and mold production cost
d. Automation tools for die and mold design
e. Technology to enable fully automated setup of manufacturing equipment or production lines
f. Reconfigurable manufacturing equipment (e.g., LEGO-like building blocks)
g. Novel molding, casting, or forming technologies that excel at small-lot quantities
h. Manufacturing tools and equipment that are substantially lower cost than traditional tools and equipment or substantially improve the quality of current desktop manufacturing tools.
i. Novel low-cost approaches to computer vision and machine learning for manufacturing (especially integration of open source approaches)
j. Low cost and scalable manufacturing technology for emerging areas (e.g. nano-manufacturing, flexible electronics or sensors, etc.)

The structure of the half-day workshop will be highly interactive. Approximately eight researchers, chosen from the submitted abstracts, will be invited to each speak on their gamechanging idea for 10 minutes and then answer questions for 5 minutes. Additionally, some of those not chosen to speak will be invited to present their ideas through a poster located in the workshop space. Workshop attendees will be given the opportunity to review, comment on, and select the top candidate technologies, based on potential economic impact across multiple industry sectors, in separate breakout sessions followed by a general session. Presentations will be recorded and videos from the highest scoring innovations will be posted on the MForesight website. Workshops results will be published as a whitepaper available on the MForesight website.

The highest scoring innovations may participate in follow-on activities with MForesight such as:
• **Further dissemination of the idea** to industry partners and funding agencies
• **Publish the idea** as an extended blog post or op-ed
• **Investigate the impact** of the idea on U.S. manufacturing competiveness
• Potentially **co-lead a dedicated workshop** with subject matter experts

Abstract Submission

Submit two-page abstracts for the Gamechangers Workshop at http://mforesight.org/AdvMfrTech by **February 24, 2017.** Abstracts should contain at least one effective graphic and address the following questions:

- What is the technology? How is it a gamechanger relative to existing technologies?
- If the technology were fully matured with 3-5 years of funded support, what would be the potential economic impact to the U.S.?
- Once matured, what industry sectors (aerospace, automotive, semiconductor, etc.) does this technology positively impact?

All abstracts submitted will be reviewed by a joint committee comprised of members from the ASME MED, SME/NAMRI, and the MForesight Leadership Council. Researchers will be informed if their idea was selected for presentation by March 8, 2017. Questions can be directed to Joe Tesar at joe@mforesight.org.

Organizers

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MForesight: Alliance for Manufacturing Foresight is a federally-funded independent think-and-do-tank focusing on identifying the emerging technologies that will strengthen U.S. manufacturing competitiveness. Sponsored by NSF and NIST, MForesight provides crucial ideas and insights to business and government decision-makers on emerging technology trends and opportunities for public-private investments in advanced manufacturing. Learn more at http://mforesight.org.