

Bridging the Gap between Research and Manufacturing

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Abstract

After decades of shifting production offshore, fundamental engineering and production skills and capabilities have eroded and the ability to manufacture emerging nanotechnology products is severely constrained.

Thanks to the U.S. federal government investments in basic research, we still lead the world across a broad spectrum of discoveries, as reflected in publications and citations. Being the best in the world in science is important—but it's not sufficient to ensure success. We need to invest in engineering and manufacturing innovations to convert promising ideas into successful products and competitive industrial sectors. Transitioning a lab prototype into a product manufactured at scale requires process innovations to ensure high quality, reliability, yield, cost-effectiveness, safety etc. For instance, traditional manufacturing processes do not readily provide high-throughput solutions to manufacture critical nanoscale and macroscale features within a single structure or allow for precise alignment of small unit cells in three dimensions across large volumes. Addressing process challenges requires significant investment of intellect, time and resources in engineering and translational R&D. We need process innovations in nanotechnologies to retain essential know-how to innovate next generation technologies and products.

Bio



Sridhar Kota is the Herrick Professor of Engineering, Professor of Mechanical Engineering at the University of Michigan. He is the founding Director of [MForesight: Alliance for Manufacturing Foresight](#) – a federally-funded (NSF and NIST) national consortium focused on accelerating technological innovation to enhance U.S. manufacturing competitiveness. Between 2009-2012 Prof. Kota served as the Assistant Director for Advanced Manufacturing at the White House Office of Science and Technology Policy (OSTP) where he played an instrumental role in establishing National Manufacturing Innovation Institutes, National Robotics Initiative, and National Digital Engineering and Manufacturing. Kota authored over 200 technical papers, 30 patents on bio-inspired engineering systems and soft robotics. He is the recipient of the American Society of Mechanical Engineers (ASME) Machine Design Award, Leonardo da Vinci Award, Outstanding Educator Award and the University of Michigan Regents' award for Distinguished Public Service and the Distinguished University Innovator Award. He is the founder and CEO of [FlexSys Inc.](#), that developed the world's first modern aircraft with shape-changing wings.