DANIEL J. EPSTEIN DEPARTMENT OF
INDUSTRIAL AND SYSTEMS ENGINEERING

EPSTEIN INSTITUTE SEMINAR • ISE 651 SEMINAR

Aerospace Sustainment Including Process Tribology and Product Metrology

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ABSTRACT

Aerospace, long recognized as one of the United States' strongest and most competitive global industries, has been responsible for the creation of many of the nation's best and highest paying technology jobs. Shape Engineering for Advanced Manufacturing (SEAM) is a blend of innovative technologies, methodologies and expertise designed to provide rapidly reconfigurable measurement and manufacturing to support the Maintenance, Repair and Overhaul (MRO) activities of the increasing number of military, commercial and general aviation industries.

SEAM is an Oklahoma Economic Development Generating Excellence (EDGE) funded project. SEAM presents a unique business model: the combination of two entities within a SEAM enterprise: a world class research and development organization (SEAM Center), feeding technologies, products and services into a related corporation (SEAM Aero LLC) that in turn determines their best markets, and sells aggressively into those markets. The two entities continue to engage in cooperative product marketing to keep the technology set ahead of the competition.

Shape Engineering (SE) is the creation of engineering data from a damaged component through precision measurement. SE envelopes scanning and imaging, metrology and precision measurement, CAD and design rendering, and material identification and substitution analysis. Advanced Manufacturing (AM) is the use of newer manufacturing methods such as rapid manufacturing (and prototyping), deposition and powder net-shape manufacturing, and precision CNC machining to fabricate highly complex geometries in an accurate fashion. SEAM seeks to provide cheaper, faster, safer and better solutions for SE, AM and integrating logistics. Integrating logistics in this context extends from process specific factors such as tribology and material property modification, to systemic factors such as factory planning, process/system integration, tooling design, process planning and tolerance design.

Further to serving as next generation technology incubators, three elements of uniqueness—Research, Training and Education-- will serve to create and sustain the nation's technical workforce. Together we have the power to act as agents of change, by creating a superior workforce that leads to even further development of cutting-edge technologies.

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ELECTRICAL ENGINEERING BLDG ROOM 248
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BRIEF BIO

Dr. Shivakumar Raman, a tenured full-professor in IE, is *David Ross Boyd Professor*, and *John A. Myers Professor* in Engineering in the School of Industrial Engineering at the University of Oklahoma. Earlier, he held a S.R. Noble Foundation Presidential Professorship. He teaches courses in the areas of materials, manufacturing processes and metrology. He is an Elected Fellow of 3 major engineering societies: SME, ASME and IIE. He is the current Scientific Committee Chair (Chief Editor) for the North American Manufacturing Research Institution of SME (NAMRI/SME) and also serves on its Board of Directors (2008-2010).

He has served as an associate editor for the Journal of Manufacturing Systems and Journal of Manufacturing Processes (both of SME), and ASME Transactions: Journal of Manufacturing Science and Engineering; and as an editorial board member for IIE Transactions (Journal of Design and Manufacturing), and International Journal of Precision Engineering and Manufacturing (KSPE). He has organized satellite symposia in advanced manufacturing processes and advanced materials for ASME. He was the Manufacturing Engineering Division (MED) program chair for ASME in the National Manufacturing Week (NMW) 2003 and 2004. He was also the MED program committee chair for ASME IMECE 2005, and organized 37 sessions in manufacturing engineering.