Augmented Reality for Smart Manufacturing: A Panel Targeting New Standards Opportunities

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Paul Huang – Office of Naval Research (ONR)

Mr. Paul Huang, Program Officer at Office of Naval Research responsible for Advance Manufacturing Enterprise thrust for Navy ManTech program, and currently serves as the chair of the Advance Manufacturing Enterprise (AME) subpanel of the Joint Defense Manufacturing Technology Panel.

He currently serves as the COR for the Naval Shipbuilding and Advance Manufacturing (NSAM) Center of Excellence. Also currently manages the 6.2 projects line for Navy ManTech focusing on Manufacturing Applied Research. He is also actively involved with various Manufacturing USA institutes in particular the DMDII and ARM. Previously worked at the Army Research Laboratory where his research was in the areas of inorganic composite development, thermal barrier coatings for diesel engines, tribological coatings for bearings, and was past DoD Coordinator for MIL-HDBK-17 Metal Matrix and Ceramic Matrix Composites volumes.

Paul received a BS in Materials Science & Engineering from Virginia Tech, and MS in Mechanical Engineering from Northeastern University.

Sundar Murugappan, PhD – Intuitive Surgical

Sundar is a Senior Research Scientist at Intuitive Surgical and he focusses on both fundamental and applied research in Augmented/Mixed Reality (XR), Computer Vision and AI. and their applications in Medical Robotics such as Operating room efficiency, Training, Manufacturing and Field Services.

Prior to Intuitive, he was a researcher at GE Global Research where he focused on building XR solutions for Manufacturing and Quality Inspection in the Industrial sectors. He has been successful in transitioning prototypes to commercial products/solutions that are being used today.

He has a MS and a PhD in Mechanical Engineering from Purdue University, and MS in Biological Sciences and BS in Mechanical Engineering from BITS Pilani, India.

Rafael Radkowski, PhD – Iowa State University

Rafael Radkowski is Assistant Professor in the Department of Mechanical Engineering at Iowa State University with courtesy appointments in Computer Science and Computer Engineering. Dr. Radkowski's research interests span from augmented reality to computer vision & image processing, tightly integrated with machine learning and human-computer interaction.

His current research focuses on convolutional neural networks for object detection and pose estimation with a minimum of training data as well as on computer-supported training. Application domains for his research are augmented reality-based assembly assistance and training, assembly verification and quality control, as well as nondestructive evaluation.

He collaborates with several organizations such as Rockwell Collins, John Deere, Fluor / Naval Nuclear Laboratory, the Airforce Research Laboratory, and Danfoss Power Solutions to investigate practical applications of his research.

John Simmins, PhD – Electric Power Research Institute

Dr. John J. Simmins is a Technical Executive at the Electric Power Research institute (EPRI) where he manages the Information and Communication Technology for Distribution project set. Dr. Simmins leads the EPRI efforts in the use of augmented reality, social media, data analytics, and visualization to improve outage restoration efforts and improve grid resilience.

He received his B.S. in Ceramic Science (Physics Minor) from Alfred University in 1984 and a Ph.D. in 1990 from Alfred University where he studied the calculation of crystal structures for ceramic superconductors. He also holds a graduate certificate in Machine Learning from Washington State.

Sandy Ressler – High Performance Computing and Visualization Group, NIST

Sandy Ressler has over 40 years of experience with a wide variety of computer graphics and user interface technologies. Starting a career at Bell Labs followed by a stint at a video game startup he is a pioneer and visionary in the development of 3D computer graphics for use on the Internet.

For the last 30ish years he's been a scientist at the National Institute of Standards and Technology. He was on the Web3D Consortium's, Board of Directors for 6 years, two of which as Vice President. The consortium is the organization responsible for VRML/X3D the ISO standard for 3D on the Internet. From 1997-2001, he created and ran the world's leading web site for 3D on the web at About.com.

Ressler ran several Web3D Showcase events (demonstration events) at SIGGRAPH (the premier conference for the computer graphics industry) which exposed tens of thousands of people to Web3D applications. He has published over 20 peer-reviewed articles and is widely regarded as one of the leading figures in the industry. Ressler has also authored three books, two on electronic publishing and coauthored the classic "Life with UNIX". He holds an MFA in visual arts (computer graphics) from Rutgers University which generally confuses his management.

Useful resources to frame the discussion

- Augmented Reality for Enterprise Alliance (AREA). Industrial consortium of technology providers and users. Link: http://thearea.org/

- EPRI, 2017. Program on Technology Innovation: Enterprise Augmented Reality Vision, Interoperability Requirements, and Standards Landscape. 2017 Technical Report.
  Link: https://www.epri.com/#/pages/product/3002010514/?lang=en-US