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Introduction

This year's conference concentrated on new ideas, technologies, and potential applications across a wide range of disciplines critical to nano-, bio-, and info-tech-based sensors and systems as applied to health monitoring of human and complex systems in engineering and medicine. The focus was on emerging areas of wearable technology, smart textile innovation, 3D printing of sensor systems, thought-controlled devices and systems, mobile wearable healthcare systems, wireless power feedback routines and devices for medical technology, smart optical materials technology, long-life micro-power systems, and thermoelectric energy conversion films and systems.

This is the first time SPIE Smart Structures/NDE held a 3D printing session and demonstration as part of the 2017 Nano-, Bio-, and Info- Tech Sensors and 3D Systems conference held in Portland, Oregon. Our aim for introducing this important technology into this conference was to enable discussion among scientists, researchers, and engineers of novel ideas for its use in healthcare and improving quality of life.

Researchers from academia and industry showcased their accomplishments and inventions in the field of advanced 3D printing to fuel further exploration and advancement in the field. The 3D printing demonstration and presentation sessions drew strong interest among attendees, as sessions included innovative applications of 3D printing technologies focusing on soft robotics, molecular models, food, biosensors, implantable and non-invasive medical devices, IoT in healthcare, and microstructures.

This activity attracted researchers from all over the world. Professor Hidemitsu Furukawa and Dr. Ajit Khosla from Yamagata University in Japan displayed artistic and innovative approaches of using 3D printing to rapidly fabricate high-strength gels and soft materials. They also displayed various modeling techniques to mimic human structures and organs that could be 3D printed. Another interesting break-through in 3D printing technique included printing of edible food.

Similarly, researchers from University of Tokyo, Keio University, University of Rajshahi, and Nagoya University demonstrated the effectiveness and usage of 3D printing in IoT, smart sticks for the blind, soft-bodied robotic structures, and human models. One of the demonstrations focused on 3D printing of biosensors and wearable devices for applications in neurocardiology and healthcare. A research group at Penn State demonstrated wireless biosensors based on fractal geometries that could noninvasively record and transmit pathophysiological signals.

Other notable wearable technology talks were given by Mouli Ramasamy and Nanshu Lu of University of Texas. In a keynote on "Can artificial intelligence (AI)

provoke the revolutionary change in the medical field?" Uhn Lee emphasized the future application of engineering and science in medicine. A catheter-based sensor and ablation system with patient video was presented by Varadan.

Based on the tremendous success of the 2017 3D printing sessions, more researchers and scientists are planning to attend and show live demonstrations of some of the most futuristic 3D printing applications in next year's SPIE Smart Structures/NDE conference in Denver. Professor Furukawa said he was impressed by the response and interest and would want to perform live 3D printing demonstrations in Denver. Similarly, Dr. Khosla added that he would want to 3D print edible sushi for the attendees next year.

I thank all the authors and chairs for their contributions to this year's very exciting conference. I also thank SPIE for supporting the introduction of 3D printing into this year's conference and for supporting its continuation at next year's conference in Denver.

Vijay K. Varadan