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Metrology for Industry 4.0 & IoT

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CNR - NATIONAL RESEARCH COUNCIL HEADOUARTERS - Piazzale Aldo Moro

CALL FOR PAPERS for the Special Session on

MEASUREMENT SCIENCE AND DESIGN FOR ADDITIVE MANUFACTURING

Additive Manufacturing (AM) offers many advantages over conventional fabrication, for its ability to create free-form and customized parts with internal complex shape. Measurement science and design methods are mandatory for improving the efficiency of AM. Streamlined design-to-product transformation plays an important role in the evolution of measurement science and leads towards more advanced and integrated AM technologies, which are accessible for small and medium-sized companies, thus increasing industrial competitiveness. Rapid qualification of AM materials and processes clearly provides a better understanding of AM and more confidence in AM products used in industry.

Furthermore, in the development of 3D structures with tailored properties, the potential of AM has also been widely reported with a special focus on the development of customized prostheses and scaffolds for tissue engineering (TE). Specifically, the synergistic combination of cells and 3D porous scaffolds with an interconnected pore network is crucial for tissue regeneration. In this context, measurement science strongly supports AM, allowing the design and fabrication of advanced implants as well as scaffolds with complex shapes, reproducible architecture, tailored mechanical and mass transport properties.

Accordingly, this session addresses the integration of measurements and standards necessary to develop and deploy advances in design for AM methods. End-to-end digital implementation of AM processes, systems and devices is the goal.

The session would also discuss about standardized material characterization methods, exemplar data sets and databases to accelerate the design and use of additively manufactured structures for different kinds of applications as well as about an information systems architecture, including metrics, information models, and validation methods to shorten the design-to-product cycle time in AM.

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