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Advanced Manufacturing Technologies for Micro- and Nanosystems in Security and Defence

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Editors

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Introduction

The first conference on Advanced Manufacturing Technologies for Micro- and Nanosystems in Security and Defence was held in Berlin (Germany) on 10-11 September 2018, in the framework of the SPIE Security + Defence 2018. The scope of the conference is to establish an international forum for discussing on the most cutting-edge manufacturing technologies of photonic and optoelectronic systems, which are relevant for security and defense applications. In this framework, photonic technologies are playing an increasing leading role, enabling innovative, portable, wearable and self-powering devices capable of generating and detecting light. Thanks to their high sensitivity and fast response times, photonic devices are expected to provide new efficient and non-invasive tools for sensing and imaging applications, which are highly relevant in fields with high societal impact such as security and defense.

The two days of technical sessions provided an updated overview of the state-of-the-art of the most advanced manufacturing technologies for photonic and optoelectronic devices, which included emerging high resolution photo-patterning methods, laser-based printing approaches, 3D printing methodologies, nanomaterials synthesis, as well as advanced fabrication methods for sensing and imaging applications by the use of novel 3D and 4D architectures.

This volume contains contributions which highlight recent advanced in the field of advanced manufacturing, such as the novel 3D printing technologies for transparent glasses and laser microfabrication approaches for micro-robots, which can be driven by light and be exploited as controlled and localized heat source in microfluidic devices. Nanotechnologies are also reviewed as enabling methodologies for materials with innovative properties. Examples include the fabrication of gas sensor devices and hybrid nanoscale waveguides with graphene, featuring nonlinear optical properties.

It was a great pleasure for the conference chairs to launch and organize the first edition of this conference, and we acknowledge all authors for their contributions to the symposium. Special thanks go to the invited speakers for their exciting and inspiring presentations, and to the members of the Program Committee for their valuable advice. We also thank the SPIE staff, for their efforts and outstanding services in preparing the conference and publishing the Proceedings.

Andrea Camposeo
Yuris Dzenis
Maria Farsari
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