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This special section of *Optical Engineering* on speckle metrology has been published as a follow-up to the conference "Speckle 2012: V International Conference on Speckle Metrology," which was held in Vigo, Spain, from 10–12 September 2012.

Many of the articles are extended and improved versions of papers presented at the conference and published in SPIE Proceedings Vol. 8413, whilst others have been originally submitted in response to the call for papers for this special section.

Naturally, it is not possible to provide a comprehensive panorama of the state of the art of this discipline within the limited space available for a single special section. However, the papers compiled here cover a very representative range of topics in speckle metrology and related techniques, ranging from the fundamentals and properties of speckle patterns—which are analyzed from two different viewpoints by Sheppard (nonparaxial, three-dimensional, and fractal speckle) and Sjödahl (dynamics of multispectral speckles)—to well-established techniques such as digital holography, digital image correlation, and shearography: Khodadad et al. propose a shape measurement method that combines dual-wavelength digital holography with the analysis of speckle movements; Baldi and Bertolino report on a method for the *a posteriori* correction of the interpolation error in digital image correlation, and Zhu et al. review the performance of temporal phase-shift algorithms for real-time digital shearography.

Fringe analysis is a very active topic of research and this also holds true in the case of speckle metrology: in this special section, three papers deal with this issue. Sawaf and Groves present a machine learning approach to the automated location of phase discontinuities; Muravsky et al. compare the performance of two two-step blind phase-shift methods for electronic speckle pattern interferometry, and Heshmat et al. propose a phase unwrapping algorithm intended to deal with singular points, which are a common concern in phase maps resulting from speckle fields.

An emerging trend is bringing together metrology and information technology. Osten et al. envision and propose the integration of speckle metrology techniques in laboratories with remote access to researchers worldwide.

Applications in science and engineering have always been a major driving force of research in speckle metrology, as shown here by a set of five papers that deal with diverse topics such as the measurement of corrosion layers (Andrés et al.), roughness (Bodendorfer et al.), ultrasonic waves in metals (Rodríguez-Gómez et al.), vibrations in biomedical applications (Khaleghi et al.) and the characterization of flat-panel displays (Pozo et al.). This application-driven research has also led to the design and development of speckle metrology instruments (Fernández et al.) and, ultimately, portable devices intended for field applications such as residual stress measurement (Viotti and Albertazzi) or aeronautical nondestructive testing with far-infrared interferometry (Vandenrijt et al.).

This variety of subjects and exciting applications evidences the present vitality of speckle techniques not only in the simpler and robust pointwise implementations, but also and especially in the full-field, massive parallel-sensing arena, where methods like digital image correlation, speckle pattern interferometry, or digital holography have experienced a remarkable progress. We hope that gathering together in this special section some selected samples of the current developments in speckle metrology will serve to enhance the visibility and to broaden the scope of these fascinating techniques located somewhere between the deterministic and the stochastic worlds.

Finally, we would like to thank all the people who have made this special section possible, including SPIE's staff and the editor-in-chief of *Optical Engineering*, for providing the opportunity to prepare it, all the authors who submitted their contributions, and the referees, who devoted their time and effort to the thorough review of the manuscripts.

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