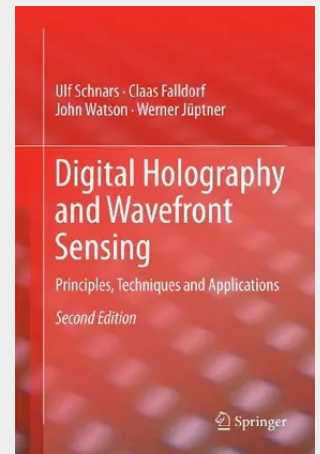


Digital Holography and Wavefront Sensing

Principles, Techniques and Applications

This highly practical and self-contained guidebook explains the principles and major applications of digital hologram recording and numerical reconstruction (Digital Holography). The first part deals with optical foundations and the theory of holography. The next section describes how to record holograms directly with an electronic sensor (CCD) and describes the various reconstruction techniques. A special chapter is designated to digital holographic interferometry with applications in deformation and shape measurement and refractive index determination. Applications in imaging and microscopy are also described. Also discussed are special techniques such as digital light-in-flight holography, holographic endoscopy, information encrypting, comparative holography, and related techniques of speckle metrology.

This book presents a self-contained treatment of the principles and major applications of digital hologram recording and numerical reconstruction (Digital Holography). This second edition has been significantly revised and enlarged. The authors have extended the chapter on Digital Holographic Microscopy to incorporate new sections on particle sizing, particle image velocimetry and underwater holography. A new chapter now deals comprehensively and extensively with computational wave field sensing. These techniques represent a fascinating alternative to standard interferometry and Digital Holography. They enable wave field sensing without the requirement of a particular reference wave, thus allowing the use of low brilliance light sources and even liquid-crystal displays (LCD) for interferometric applications.



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