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Sommario/riassunto	This thesis covers a broad range of interdisciplinary topics concerning electromagnetic-acoustic (EM-Acoustic) sensing and imaging, mainly addressing three aspects: fundamental physics, critical biomedical applications, and sensing/imaging system design. From the fundamental physics perspective, it introduces several highly interesting EM-Acoustic sensing and imaging methods, which can potentially provide higher sensitivity, multi-contrast capability, and better imaging performance with less distortion. From the biomedical applications perspective, the thesis introduces useful techniques specifically designed to address selected challenging biomedical applications, delivering rich contrast, higher sensitivity and finer spatial resolution. Both phantom and ex vivo experiments are presented, and

in vivo validations are progressing towards real clinical application scenarios. From the sensing and imaging system design perspective, the book proposes several promising sensing/imaging prototypes. Further, it offers concrete suggestions that could bring these systems closer to becoming “real” products and commercialization, such as replacing costly lasers with portable laser diodes, or integrating transmitting and data recording on a single board.