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Mark A. Anastasio* (anastasio@wustl.edu), Washington University in St. Louis, Dept. of Biomedical Engineering, St. Louis, MO 63110. *Optimization-based Image Reconstruction Methods for Photoacoustic Computed Tomography.*

Photoacoustic computed tomography (PACT) is an emerging soft-tissue imaging modality that has great potential for a wide range of preclinical and clinical imaging applications. It can be viewed as a hybrid imaging modality in the sense that it utilizes an optical contrast mechanism combined with ultrasonic detection principles, thereby combining the advantages of optical and ultrasonic imaging while circumventing their primary limitations. In this talk, we review our recent advancements in practical image reconstruction approaches for PACT. Such advancements include physics-based models of the measurement process and associated inversion methods for reconstructing images from limited data sets in acoustically heterogeneous media. Applications of PACT to transcranial brain imaging and breast cancer detection will be discussed. (Received January 14, 2015)