Ultrasound Distortion Compensation Using a “Blind System Identification” Method

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Technology description

In this invention, the method of blind system identification (BSI), which was developed to address distortion in wireless telephone communications, is applied to ultrasonic imaging. BSI is used first to estimate the effective filtering done by the tissue inhomogeneities and then to create corresponding filters to compensate for the aberration on both transmission and reception. In order to apply the BSI compensation technique, a two-dimensional array of imaging transducers is desired (a “1.75-d” array is acceptable), and a considerable amount of computation must be performed. Thus, the technology is applicable primarily for high end imaging systems.

Application area

This technology provides an increase in the resolution of ultrasound imaging by a new method of compensating for waveform aberration caused by muscle, fat and other tissue inhomogeneities.

Advantages

Medical use of ultrasound for diagnostic imaging of the heart, abdomen, and fetus is now limited by wave front distortion caused by inhomogeneity within tissue that degrades geometric focusing to yield images less than satisfactory for accurate diagnosis. Earlier attempts, using a single-phase screen method, compensate for time-shift distortion alone. This new method includes not only arrival time shifts, but also amplitude variations and waveform shape changes.

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