



Highly Constrained Image Reconstruction (HYPR) for Ultrasound Imaging

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WARF: P08049US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing an application of the HYPR image reconstruction method to improve the quality of ultrasound image frames.

Overview

The HYPR method, as described in WARF reference number P06088US, reconstructs a composite image from acquired data to provide *a priori* knowledge of the subject being imaged. This composite image then is used to constrain and improve the image reconstruction process. HYPR can be used with a variety of imaging modalities.

In ultrasound imaging, the “backscatter” method produces images by transmitting sound into an object, and then collecting the “echo” of the sound as it bounces back to a receiver on the same side of the object as the transmitter. However, the data acquisition rate in ultrasound is limited because of the relatively slow speed of sound in soft tissue, resulting in image frames acquired through undersampled data. Additionally, imaging deeper tissue with ultrasound requires lower frequency sound beams, which results in lower image resolution.

The Invention

UW-Madison researchers have now applied HYPR to ultrasound, resulting in higher quality ultrasound imaging frames with improved spatial resolutions and signal-to-noise ratios. A composite image is formed by combining acquired ultrasound image frames that are higher resolution and have a lower signal-to-noise ratio. The resulting composite image has a much higher signal-to-noise ratio than the individual ultrasound image frames. Individual image frames then are processed using the composite image as *a priori* information, resulting in a highly constrained image frame that retains both the high signal-to-noise ratio of the composite image and the temporal and spatial resolution of the acquired image. This enhancement method results in higher quality ultrasound imaging.

Applications

- Highly constrained image reconstruction in ultrasound imaging

Key Benefits

- Improved signal-to-noise ratio and image resolution

Additional Information

For More Information About the Inventors

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Related Technologies

- [For more information about HYPR image reconstruction, see WARF reference number P06088US.](#)



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Tech Fields

- [Medical Imaging : Ultrasound](#)

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