



## Composite Images for Clearer Ultrasound

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**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method that provides higher quality ultrasound by combining images taken at different times and frequencies.**

### Overview

Ultrasound is a crucial diagnostic tool, capable of imaging body parts like a beating heart and measuring tissue elasticity. Modern systems can produce individual images as well as video. While video captures more motion and spatial information, it is not practical to examine every frame.

In theory, data from successive frames could be combined into a higher-resolution composite. This has been difficult to achieve in practice. One challenge is motion between images. Also, proper alignment is difficult because ultrasound images don't have consistent registration features like sharp edges or well-defined corners.

### The Invention

UW-Madison researchers have developed an algorithm that combines ultrasonic data from multiple images into a high-resolution image or video.

To combine images taken at different times, each of the images is first subdivided into corresponding regions. These are separately registered in rotation and translation, and then combined into a high-resolution image. The process is repeated to create video.

The method can be extended to combine images obtained at different frequencies. This takes advantage of the fact that higher frequencies provide sharper detail closer to the ultrasound machine while lower frequencies are better with distance. Accordingly, acoustic distance is considered when weighting frequency data and combining images.

### Applications

- Software for ultrasound imaging and elastography

### Key Benefits

- Improves ultrasound image and video quality
- Improves the accuracy of elasticity tissue measurements
- Addresses the problems of intra-image motion and alignment
- Reduces susceptibility to artifacts like speckle noise

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Stage of Development

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Testing with tendon tissue under strain produced larger videos with greater clarity and detail. The videos also showed considerably less flicker or visual jittering. Error in strain measurement was reduced from an average of 33 percent to one percent.

## Additional Information

### For More Information About the Inventors

- [Ray Vanderby](#)

### Related Technologies

- [WARF reference number P03347US describes a method for improved ultrasonic strain measurements of soft tissue.](#)

### Tech Fields

- [Medical Imaging : Ultrasound](#)

For current licensing status, please contact Jeanine Burmania at [jeanine@warf.org](mailto:jeanine@warf.org) or 608-960-9846

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