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First-Person Perspective, Patient-Registered Medical Image Visualization

In standard medical practice, the patient and their medical image data are decoupled after imaging. Image visualization is primarily confined to screens that are not registered with respect to the patient's body. This is cumbersome and requires more time for healthcare providers to orient the images relevant to the patient. It would be ideal to have images viewed concurrent with patient examination or surgery.

Researchers at Arizona State University have developed novel software for providing a first-person perspective, patient-registered image. This software uses a visualization device (tablet, video glasses, etc.) to link previous imaging scans, in real time, with a patient. The orientation of the patient is automatically recognized, and updated in real time, so that the medical staff can place the device over parts of the patient to see the medical images for that part of the patient. Users can scan through multiple imaging scans and move through them in 3D as well as see simulated blood flow.

The ability of this software to register scans and medical images with patient position, in real time, can have tremendous impact in every hospital and medical center worldwide, especially for surgical pre-op preparations.

Potential Applications

- Surgery pre-op preparations
- Teaching – can demonstrate to medical students, orientation, location and spatial relevance of anatomical structures without having to open the tissue
- Diagnostics – the hemodynamic aspect allows current real-time evaluation and post-op diagnostics
- Understanding current blood flow in various locations and after surgery

Benefits and Advantages

- The medical image data is registered to the patient, so it can be viewed from a first-person perspective with respect to the patient's orientation

Inventors

David Frakes

Dustin Plaas

Mark Spano

Ross Maciejewski

Jonah Thomas

Contact

Jovan Heusser
jovan.heusser@skysonginnovations.com

- The device can be moved around the body to show both anatomical structure as well as hemodynamics
- Provides a better spatial understanding prior to surgery, reducing the risk of extended surgery time and surgical mistakes
- Can teach medical students without having to open up tissues

For more information about the inventor(s) and their research, please see [Dr. Frake's directory webpage](#)