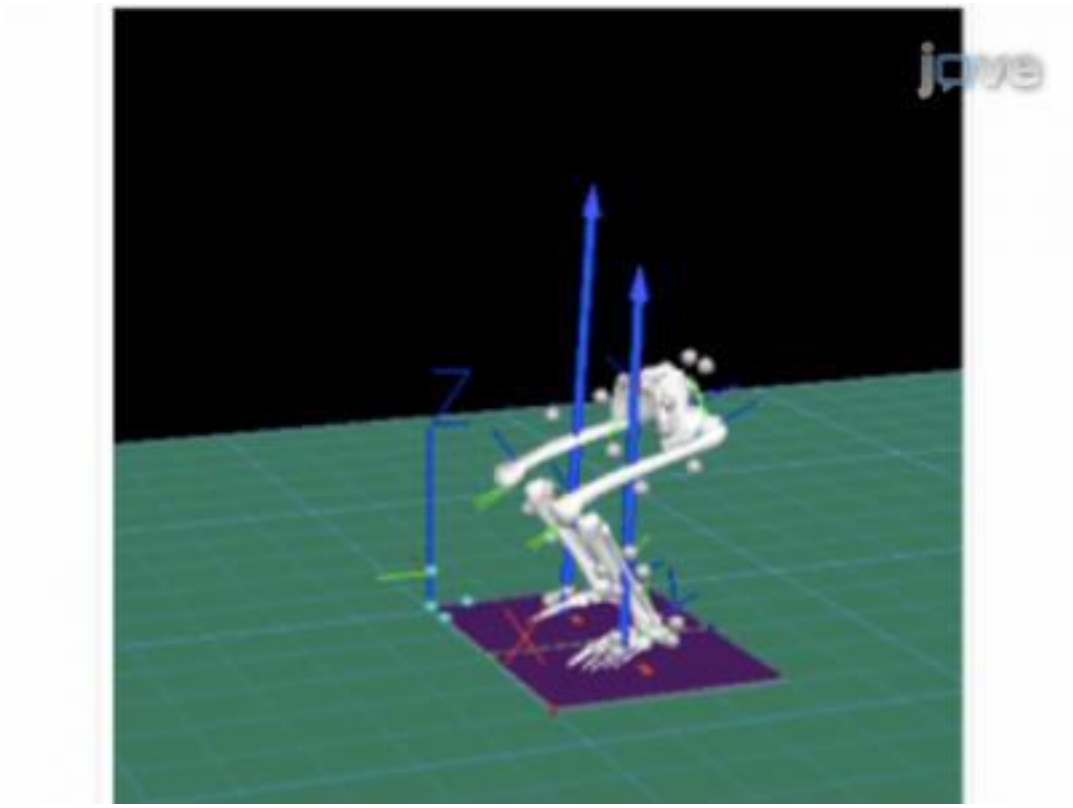
Osteoarthritis and the (not so) Painful Step Toward a Cure

The Journal of Visualized Experiments



On Tuesday, September 17, JoVE, the Journal of Visualized Experiments, will publish a novel technique for imaging muscle function while in motion. Research in this area could uncover the root of musculoskeletal disorders, such as the development of osteoarthritis following ACL surgery.

"The technique uses ultrasound waves to detect the motion of muscles using the Doppler principle," said the lab's principal investigator Dr. Siddhartha Sikdar, "We use a stereo method, where ultrasound waves from multiple directions are combined ... with a number of other biomechanical measurements of joint movement."

Click here to view a video of this experiement. [1]

When used simultaneously, the data collected by this method provides Dr. Sikdar's team a detailed look at the multiple aspects of human movement involved in preforming a dynamic task — for example, "how much force is being applied at the knee, and how much muscle is working," said Dr. Sikdar.

And while the individual techniques themselves are not new, the combination of information from ultrasound and several other procedures such as 3D motion

capture is altogether a unique and promising idea. "We believe that this integrated approach can help us better understand the underlying causes of osteoarthritis development," said Dr. Sikdar. He hypothesizes that the development of osteoarthritis is due to abnormal forces acting on the knee, leading to injury and degeneration.

"Once these abnormalities are identified, targeted intervention programs can be implemented to correct for these abnormalities," said Dr. Sikdar, "Further, we can also do subject-specific models based on actual data rather than using animal or cadaveric data."

JoVE will publish Sikdar's article alongside a video reconstruction of the experiment to ensure its reproducibility. "The ability to use video to demonstrate the methods is definitely a great advantage of this journal," said Dr. Sikdar.

For more information, visit The Journal of Visualized Experiments [2].

Source URL (retrieved on *03/09/2014 - 8:01pm*):
http://www.mdtmag.com/news/2013/09/osteoarthritis-and-not-so-painful-step-toward-cure

Links:
[1] http://www.jove.com/video/50595/a-novel-application-of-musculoskeletal-ultrasound-imaging
[2] http://www.jove.com/