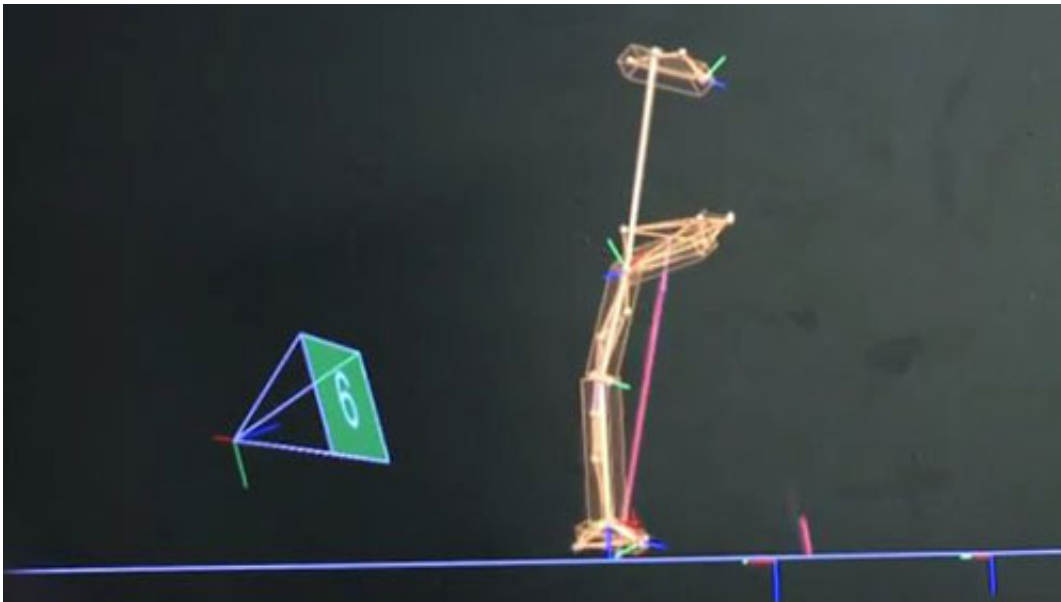


## Video: XROMM puts biomechanics on the fast track

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Aches and pains got you down? The way you walk could be wearing out parts of your body. With support from the NSF's Human-Centered Computing Program (HCC), Stanford University mechanical engineer Mark Cutkosky and his team are using volunteer test subjects to find out about one of the major problems at the root of knee pain--uneven wear and tear on the knee cartilage, which leads to arthritis. Cutkosky's research, known as Movement Retraining, focuses on alleviating pain by analyzing and possibly changing a person's stride. The goal is to slow the rate at which arthritis progresses and thereby delay or even eliminate the need for surgery. The research team outfits test subjects with sensors and then directs them to walk on a treadmill where custom software precisely calculates forces on the joints. That data helps the team determine if a gait change might help reduce pain. Credit: Science Nation, National Science Foundation

The protective shells that have helped keep turtles around for millions of years have also kept scientists guessing about just what's going on inside.

With support from the National Science Foundation (NSF), biologist Elizabeth Brainerd and her team at Brown University have developed X-ray Reconstruction of Moving Morphology, or XROMM, a [new technology](#) that combines CAT scan and X-ray technology for visualizing bones and joints in motion, in both animals and humans. Brainerd incorporates MAYA, the same animation software used to create high-end Hollywood special effects, to layer the XROMM images together to create 3-D visualizations.

XROMM has already transformed studies of vertebrate animal motion. In fact, the technology has proved such a useful tool that other labs are ramping up their own XROMM capability, and Brainerd is designing better software to meet the new demand. Her team is also putting together an [open source database](#) so researchers can quickly and easily share their visualizations.

Brainerd's project will substantially enhance the cyberinfrastructure for comparative biomechanics research and increase U.S. economic competitiveness through [technology](#) development and advanced training of the scientific workforce.

Provided by National Science Foundation

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