Researchers use motion sensors to determine equine lameness (w/ video)

March 21 2011

The most common ailment to affect a horse is lameness. A University of Missouri equine veterinarian has developed a system to effectively assess this problem using motion detection. This system has been referred to as "Lameness Locator."

Kevin Keegan, a professor of equine surgery in the College of Veterinary Medicine at MU, has been tracking horse movement related to equine lameness for years. Because equine lameness may begin subtly and can range from a simple mild problem affecting a single limb to a more complicated one affecting multiple limbs, veterinarians and horse owners know that early detection is the key to successful outcomes. The problem, Keegan says, is that detection still relies on simple visual observation with the naked eye.

"We've been developing objective methods of lameness detection and evaluation since the early 1990s as an aid to subjective evaluations," Keegan said. "We started with treadmills and high speed cameras, and those worked pretty well, but they weren't really practical due to high cost and they cannot be used in the field. Plus, horses do not move on a treadmill like they do on regular ground. In some cases with mild lameness, or in cases with multiple limb lameness, even experts looking at the same horse may disagree on whether lameness is present or on its severity. An objective method would be helpful to take some guesswork out of the evaluation."

Working with Frank Pai, a professor in mechanical engineering at MU,

and Yoshiharu Yonezawa at the Hiroshima Institute of Technology in Japan, the team developed an inertial sensor system, now in commercial use, which places small sensors on the horse's head, right front limb and croup, near the tail. The sensors monitor and record the horse's torso movement while the horse is trotting. The recorded information is compared against data bases recorded from the movement of healthy horses and other lame horses. These comparisons can help equine veterinarians improve and streamline their evaluation in a way they've never been able to do before.

"There are two reasons why the Lameness Locator is better than the naked eye," Keegan said. "It samples motion at a higher frequency beyond the capability of the human eye and it removes the bias that frequently accompanies subjective evaluation."

The product has drawn attention from outside the veterinary world; the National Science Foundation (NSF) has awarded a two-year Small Business Technology Transfer (STTR) Phase II Grant of $500,000 for further research and development of the current technology. The grant was awarded to Equinosis, a faculty start-up with license from the University of Missouri to develop and commercialize the product, after successful completion of a Phase I study which was instrumental in developing the prototype. Equinosis has subcontracted to the University of Missouri to complete some of the additional research. In this second NSF grant, the goals include expanding analysis to other gaits in horses, like the foxtrot, pace and canter, improving existing analysis sensitivity, developing a parallel device for horses that measures incoordination from neurological disease, improving sensor design, expanding analysis to type lameness based on diagnosis, developing sens! ors and expanding analysis to detect and evaluate lameness in dogs, and porting existing analysis to run efficiently on smaller computing platforms such as cell phones or iPads.

"Our biggest challenge now is to introduce this to veterinarians, train them on the proper usage and interpretation of the data, and show them that it really works," Keegan said.

Provided by University of Missouri-Columbia

Citation: Researchers use motion sensors to determine equine lameness (w/ video) (2011, March 21) retrieved 2 May 2024 from https://phys.org/news/2011-03-motion-sensors-equine-lameness-video.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.