

Wireless motion capture device with widespread applications in fitness, health

August 21 2017



Credit: Deakin University

A new "Fitbit for biomechanics" designed by researchers from Deakin University's School of Engineering has potential for industries from healthcare to sport.

The result of a three-year research project, BioKin is a low-cost wireless motion capture device that weighs under 20 grams, and easily attaches to clothing.

It can use a number of wireless 3-D motion sensors to cover the full body and specialist software to capture data that can be easily accessed in real-time via a phone app, with online accessibility via cloud storage.

Unlike other [motion capture systems](#) which track steps, sleep and heart rate, BioKin units monitor even the smallest movements of the human body, providing feedback on everything from a medical patient's rehabilitation to a golfer's swing.

Project leader Associate Professor Pubudu Pathirana said that BioKin was initially designed to assist with rehabilitation therapy.

"BioKin was created to help doctors and clinicians better monitor the progress of patients with balance disorders, recovering from strokes, living with Parkinson's disease, or regaining movement after surgery," he said.

"The small, light units provide incredibly accurate data – pinpointing movement to a greater accuracy – that give a really clear picture of how a patient is progressing with their rehab."

Associate Professor Pathirana explained that BioKin units send data straight to patients and their medical teams in real-time via a simple to

use app.

"Patients can do their rehab at home, reducing the need to visit the doctor's office or hospital," he said.

"This lessens the strain on the medical system and saves time and money for patients, especially those living in regional or remote areas."

BioKin has completed preliminary trials and is currently undergoing rigorous and formal clinical trials for balance and movement disorders, wrist and shoulder rehabilitation.

It is in secondary stage trials in major hospitals in Melbourne and units have been sold to the Royal Melbourne Hospital and the Florey Institute of Neuroscience.

However, Associate Professor Pathirana has been surprised by the interest in BioKin beyond the medical sphere.

"Since BioKin hit the market earlier this year, we've been in discussions with horse trainers who plan to strap the unit to a horse's leg to assess its range of movements," he said.

One of Associate Professor Pathirana's own team members, an engineer and golf pro, has used BioKin to improve his green-side bunker shot, the toughest shot in golf.

"By attaching BioKin units to the head of his pitching wedge, his forearm and bicep, he's been able to gather incredibly detailed and accurate data about his swing and make the necessary adjustments to see his handicap shrink even further," Associate Professor Pathirana explained.

"So we're looking at the device as a golf training tool and we intend to release BioKin for this application as well."

Associate Professor Pathirana believes uses for BioKin are limited only by imagination, and will only expand further as software developers get hold of the device.

"We provide a developer interface for people and companies who are interested in developing software components for motion analysis," he said.

"The great thing about this technology is that it is completely portable, adaptable, and empowers developers and researchers to venture in new areas of application."

He said BioKin would soon head to international markets.

"Interest in BioKin has grown steadily since it was launched on the market, with plans for export to the Middle East in the coming months.

"From Geelong to the other side of the world – it's a great example of local ingenuity making a difference and conducting research that matters," he added.

Provided by Deakin University

Citation: Wireless motion capture device with widespread applications in fitness, health (2017, August 21) retrieved 26 April 2024 from <https://phys.org/news/2017-08-wireless-motion-capture-device-widespread.html>

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