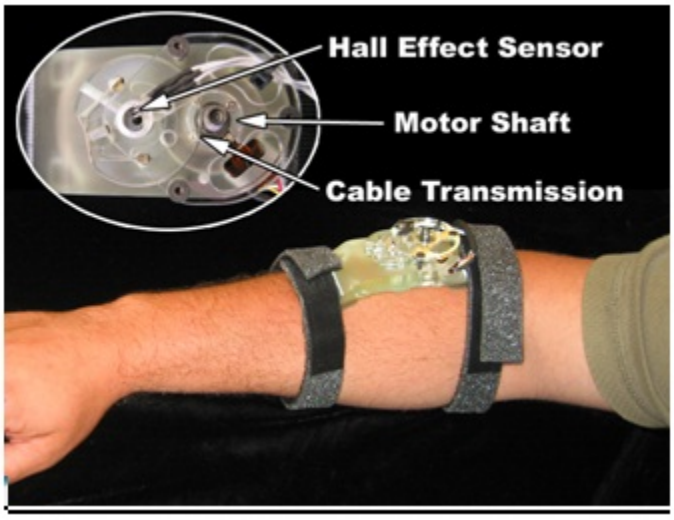
Docket #: S08-217

Tactile Feedback Device with Skin Stretch

Stanford researchers have developed a patented, wearable, haptic feedback device that provides position and velocity information on the limbs and torso by imparting rotational skin stretch. The motions and sensations produced are analogous to those obtained by placing two fingers against the skin and rotating them together. With brief training, users are able to use skin stretch to gain a sense of motion of their limbs when such feedback is otherwise missing or deficient. Applications for this device include motion training for sports or physical therapy and proprioceptive feedback for enhanced control of prosthetics.

Stage of Research:
The inventors have completed and tested a prototype of portable skin stretch device, strapped to the forearm.



Portable Skin Stretch Device

Applications

- **Medical device** - haptic feedback for:
  - motion training in rehabilitation, physical therapy or athletic training
  - proprioception in prosthetics
- **Gaming** - virtual reality control device

Advantages

- **Accurate** - Provides an accurate display of the position and velocity of joints
- **Efficient** - Provides both static position and dynamic motion with a single stimulus
- **Compact design** - Light weight, portable, requires little power, low cost components
- **Versatile design** - Shape of the device can be modified to fit various parts of the body (e.g. legs, torso, arms, hand)

Publications

- One of the *Popular Mechanics* "20 New Biotech Breakthroughs that Will Change Medicine," March 2009.
- J. Wheeler, K. Bark, J. Savall and M.R. Cutkosky, Investigation of Rotational Skin Stretch for Proprioceptive Feedback with Application to Myoelectric Systems, IEEE Transactions on Neural Systems and Rehabilitation Engineering, vol.18, no.1, pp.58-66, Feb. 2010.
- K. Bark, J. Wheeler, G. Lee, J. Savall, M.R. Cutkosky, A Wearable Skin Stretch Device for Haptic Feedback, World Haptics 2009, Salt Lake City, UT, March 2009

Patents

- Published Application: 20100161079
- Issued: 8,491,665 (USA)

Innovators

- Jason Wheeler

- Karlin Bark
- Mark Cutkosky
- Joan Savall

Licensing Contact

Matthew Ryan

Licensing Manager

Email