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Manumeter for Monitoring and Assessing Upper Extremity Rehabilitation

Tech ID: 31632 / UC Case 2013-376-0

BRIEF DESCRIPTION

After an injury or neurological event, a patient's rehabilitation requires long-term assessment and monitoring, especially in the upper extremities that are important for everyday tasks. UCI researchers have developed the Manumeter to quantitatively assess and log a patient's hand movements without external therapist intervention.

SUGGESTED USES

·Rehabilitation: real-time feedback allows the device to inform a patient if exercises are being performed incorrectly or be used as an input device for computer-based rehabilitation games

·Assessment tool: logged movement information can inform healthcare providers of patient progress and adherence to rehabilitation exercises

FEATURES/BENEFITS

·Objective: quantitative feedback is provided by device rather than subjective observations

·Sensitive: biased to detect specific hand movements (rather than responding to all movements made by the hand, arm, trunk, and lower extremity)

·Ergonomic: small form-factor is unobtrusive for everyday tasks Data-friendly: built-in micro-USB port facilitates transfer of data

FULL DESCRIPTION

Patients can suffer from impaired motor function of the hand, wrist, and arm by situations such as neurologic episodes, traumatic events, or occupational hazards from prolonged desk-work. Conventionally, motor activity logs are utilized to assess motor functionality. However, these interpretations are subjective, and can lead to inconsistent assessment results. Current device options for non-tethered hand and wrist monitoring are not ideal. Inertial sensors can be convoluted by movements that are nonspecific to the hand while glove-based systems can be bulky, obstructive, and difficult to wear for a long time.

The Manumeter is a user-friendly and objective solution to monitor and log movements in the hand, wrist, and arm. The unobtrusive device consists of only a watch-like data logger and magnetic sensor ring worn on one of the fingers. This ergonomic design enables long-term use and promotes better patient compliance. The Manumeter provides quantitative monitoring to be used by both the patient and clinician. Data from the sensor can be transferred to a computer and be read by both patient and clinician to assess rehabilitation progress and adherence to prescribed rehabilitation exercises. The Manumeter allows accurate measurement of a patient's ability to use an impaired limb in the real world and provides feedback to patient and doctor to ultimately improve patient outcomes.

CONTACT

Edward Hsieh
hsiehe5@uci.edu
tel: 949-824-8428.



INVENTORS

- » Bachman, Mark G.
- » Friedman, Nizan
- » Reinkensmeyer, David J.
- » Rowe, Justin

OTHER INFORMATION

CATEGORIZED AS

- » **Medical**
 - » Devices
 - » Rehabilitation
 - » Research Tools
- » **Sensors & Instrumentation**
 - » Medical

PATENT STATUS

RELATED CASES

2013-376-0

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,448,868	10/22/2019	2013-376

STATE OF DEVELOPMENT

Device has been developed.

RELATED MATERIALS

» Systems And Methods For Monitoring Hand And Wrist Movement Nizan Friedman, Justin Rowe, David J. Reinkensmeyer, Mark G. Bachman US Patent Application No.: US20140257143A1 Patent pending. - 09/11/2014

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Micro-electromagnetically Actuated Latched Switches
- ▶ Magnetic Recovery Method Of Magnetically Responsive High-Aspect Ratio Photoresist Microstructures
- ▶ Web-Enabled Devices
- ▶ Use Of Micro-Structured Plate For Controlling Capacitance Of Mechanical Capacitor Switches
- ▶ MEMS Sensor Enabled RFID System And Method
- ▶ Magnetically Actuated Micro-Electro-Mechanical Capacitor Switches In Laminate
- ▶ Hearing device that amplifies sound using a tympanostomy tube
- ▶ Resonating Arm Exerciser (RAE)

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5270 California Avenue / Irvine, CA
92697-7700 / Tel: 949.824.2683



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