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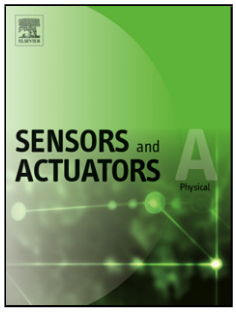

Title: Human–computer interaction using radio sensor for people with severe disability

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PII: S0924-4247(18)31087-2
DOI: https://doi.org/10.1016/j.sna.2018.08.051
Reference: SNA 10975

To appear in: *Sensors and Actuators A*

Received date: 28-6-2018
Revised date: 16-8-2018
Accepted date: 31-8-2018

Please cite this article as: Khan F, Leem SK, Ho Cho S, Human–computer interaction using radio sensor for people with severe disability, *Sensors and amp; Actuators: A. Physical* (2018), https://doi.org/10.1016/j.sna.2018.08.051

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Human–computer interaction using radio sensor for people with severe disability

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Highlights

- Conventional human–computer interaction systems present limitations.
- Disabled users cannot use them for long periods and their accuracy is low.
- We propose a system based on radar sensor, which is robust and comfortable.
- The proposed system allows communication by using breathing patterns.
- The system is highly accurate and can be used to encode several actions.

Abstract

Around the world, many people live with total paralysis, which makes it difficult to communicate using speech, text or gestures. Moreover, people with severe disabilities cannot use communication devices including computers, tablets, or mobile phones given their inability to operate conventional input devices such as keyboard, mouse, and interfaces based on speech or gesture recognition. To help paralyzed people to use electronic devices, we propose a human–computer interaction system based on the recognition of breathing patterns acquired through impulse radio ultra-wideband (IR-UWB) sensors. In particular, commands are created through different signal patterns generated by the user's inhalation and exhalation. The signal emitted from the radio sensor is directed to the user's abdomen or chest, and the reflected signal can be analyzed to recognize the

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