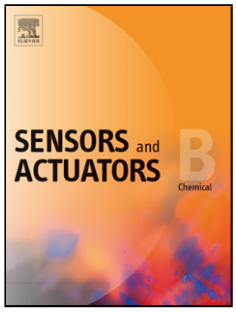

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Human activity monitoring using gas sensor arrays

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Abstract

A chemical detection system made of a gas sensor array and algorithms intended to monitor human activity was tested in a NASA spacecraft cabin simulator. Such a chemical-based monitoring system, if extended to home settings, would allow the autonomous detection of emergency situations, thereby postponing the moving of elderly people to assisted living facilities and improving their quality of life. Moreover, in contrast to other monitoring systems based on wearable sensors or video cameras, a monitoring system based on measuring changes in air composition induced by human activities would be non-invasive and would not raise privacy concerns when installed in homes. The third generation of the JPL sensor array was adapted in a small, compact and portable system and deployed in a spacecraft-like room for four weeks while volunteers were performing daily routines. The system was able to predict the total number of people and the level of activity performed in the room, while detecting unexpectedly high concentrations of volatiles.

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