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学术论文

基于Wi-Fi信号的健身行为识别

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Towards a Diffraction-based Sensing Approach on Human Activity Recognition
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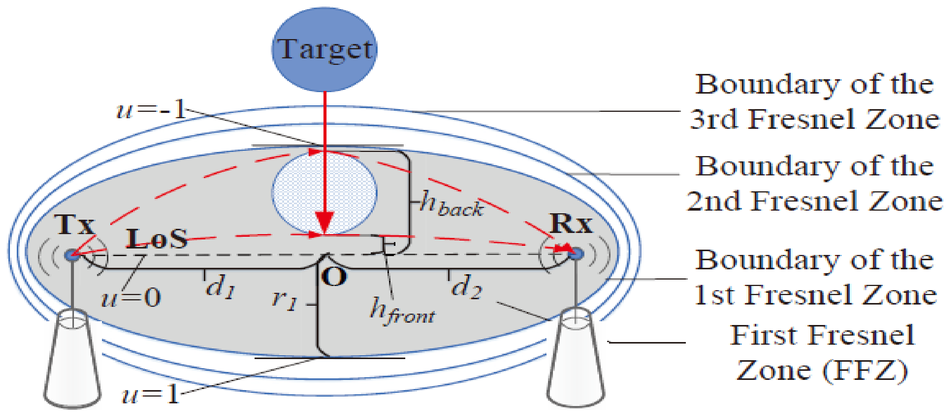
Motivation

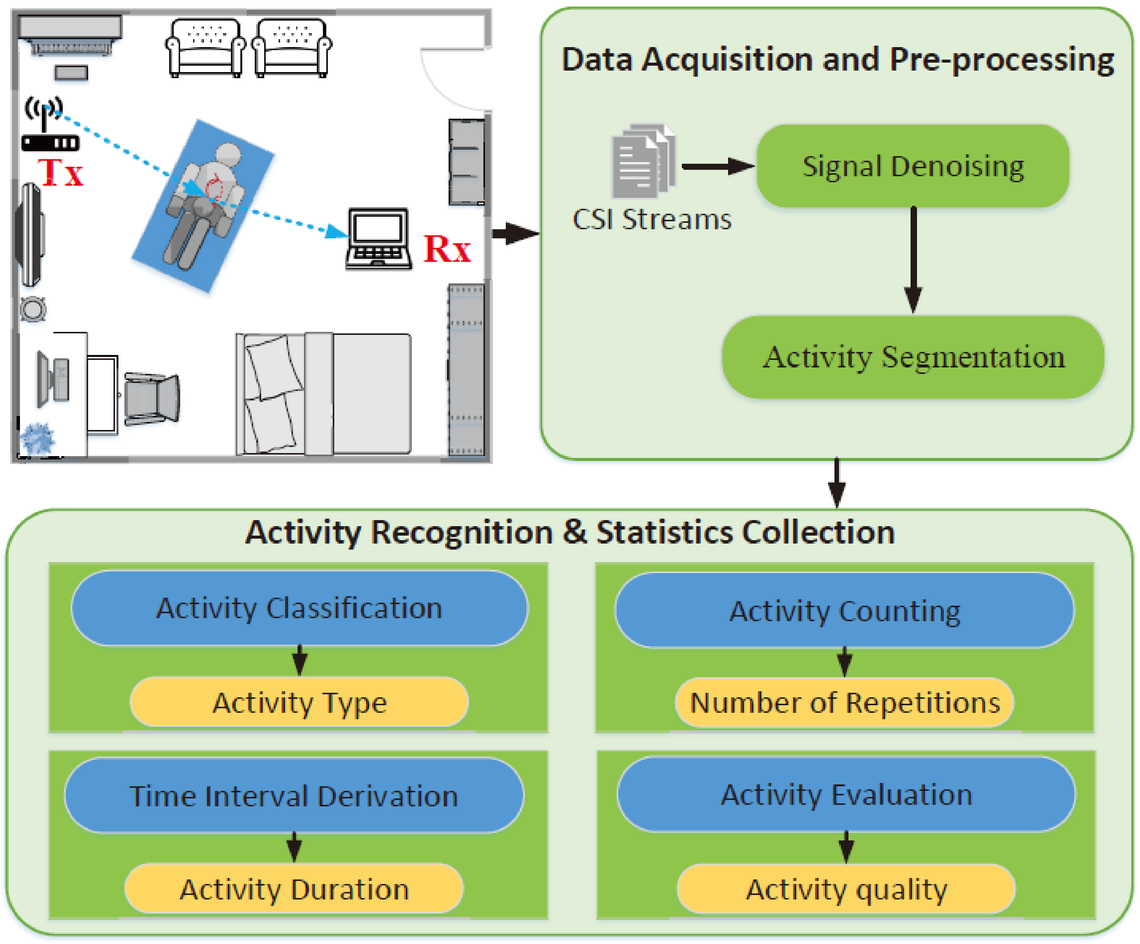
- Wireless sensing has been exploited as a promising research direction for contactless human activity recognition.
- We propose a diffraction-based sensing model to quantitatively determine the signal change with respect to a target’s motions, which eventually links signal variation patterns with motions, and hence can be used to recognize human activities.



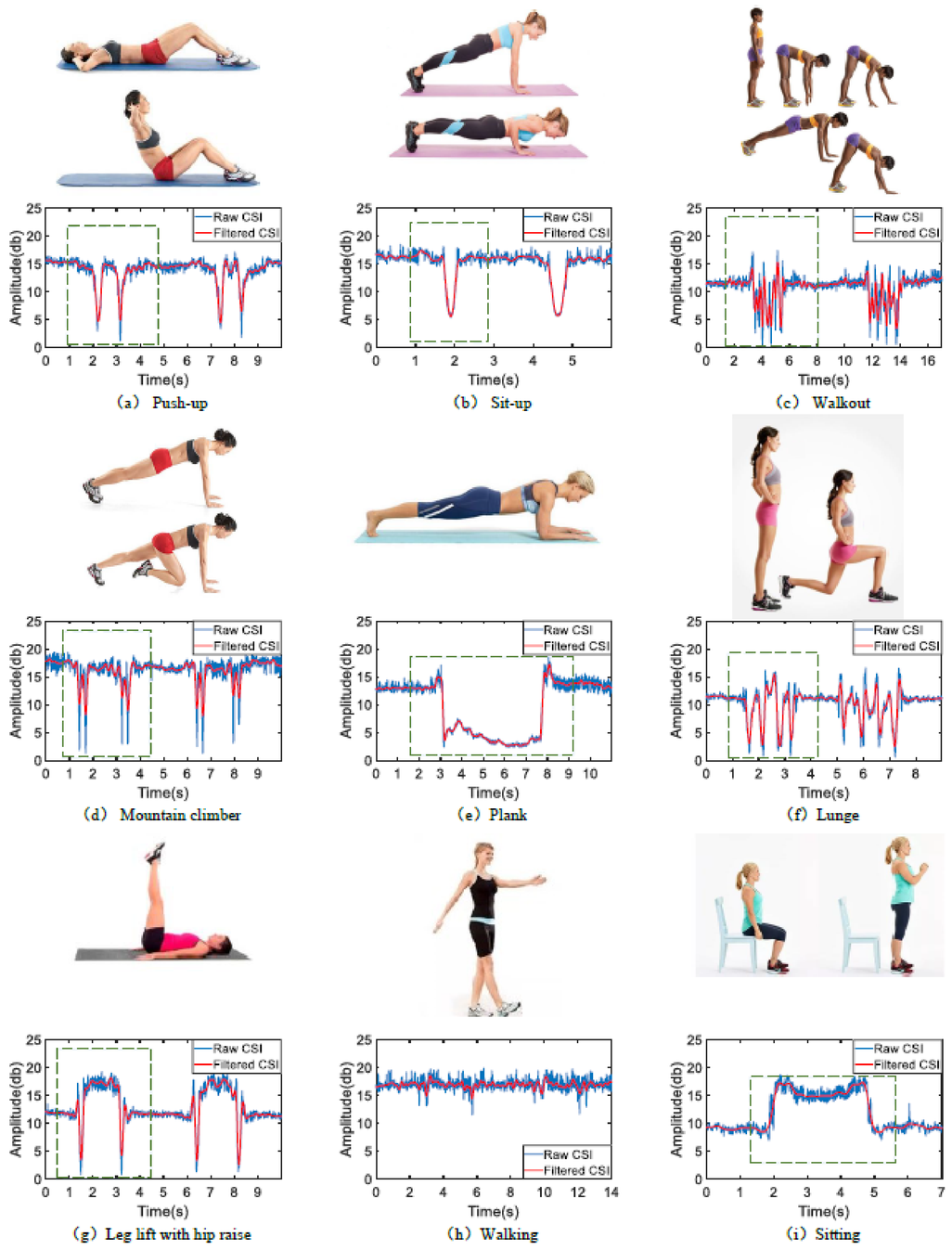
The Proposed Activity Sensing System

Sensing fitness activities using Wi-Fi signals

- Our sensing system can assist users to understand their repetitive activity status, including activity types, activity duration, number of repetitions and whether the activities are in proper forms. The users can utilize the detailed statistics to achieve more effective workouts.



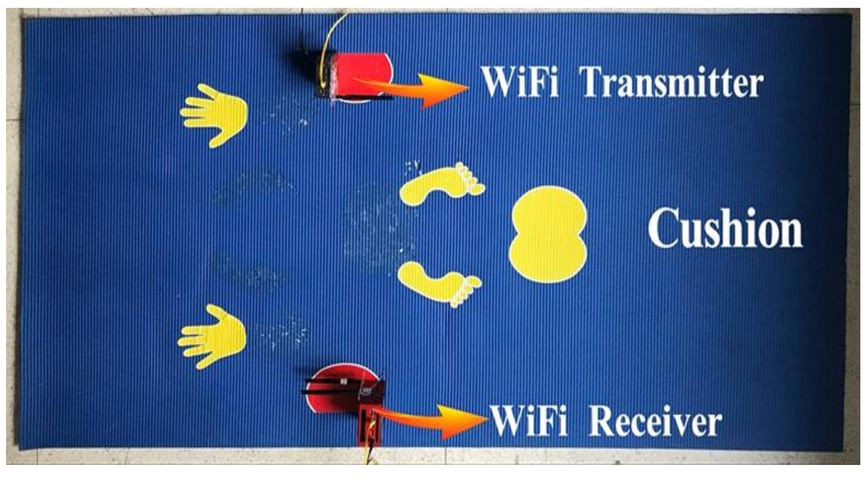
System Overview



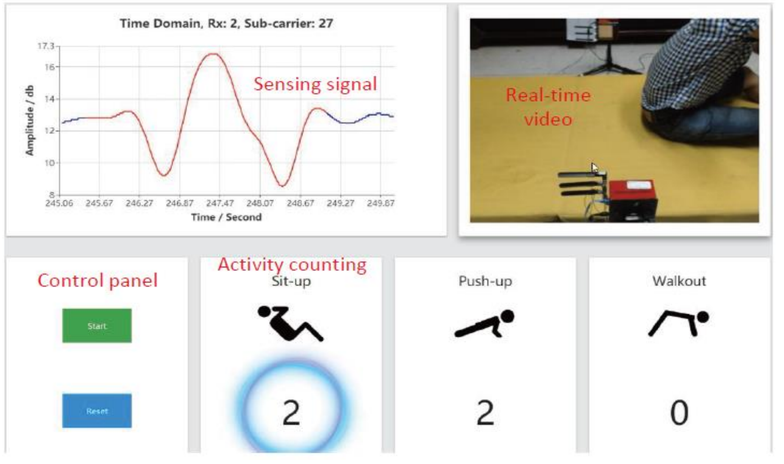
Signal amplitude patterns for 9 activities

Evaluation & Results

- Our prototype system consists of one Wi-Fi transceiver pair. Each transceiver is a Gigabyte mini-PC equipped with a cheap Intel 5300 Wi-Fi card.
- We build a web-based user interface to show the activities detected in real-time.



System setting.



Real-time system user interface.