Adaptive real-time detection algorithms for respiratory patterns based on UWB radar

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Abstract:

This paper considers the use of an impulse-radio (IR) UWB radar system to track respiratory frequency and apnea episodes in a non-invasive and real-time way. We consider the use of the Least Mean Square (LMS) algorithm together with Auto-Regressive (AR) modeling to monitor the breathing rate transitions and variations. Simulations have been performed to validate and adjust the parameters of the algorithm, balancing between its trade-offs to suit our solution to the problem. Finally, the results of the experiments are presented meeting the expected requirements and performance of the system.