

## **An Effective Noise Resistant Frequency Modulation Continuous-Wave Radar Vital Sign Signal Detection Method**

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**Abstract :** To address the problem that the FM continuous-wave radar (FMCW) extracts human vital sign signals which are susceptible to noise interference and low reconstruction accuracy, a new detection scheme for the sign signals is proposed. Firstly, an improved complete ensemble empirical modal decomposition with adaptive noise (ICEEMDAN) algorithm is applied to decompose the radar-extracted thoracic signals to obtain several intrinsic modal functions (IMF) with different spatial scales, and then the IMF components are optimized by a BP neural network improved by immune genetic algorithm (IGA). The simulation results show that this scheme can effectively separate the noise and accurately extract the respiratory and heartbeat signals and improve the reconstruction accuracy and signal-to-noise ratio of the sign signals.

**Keywords :** frequency modulated continuous wave radar, ICEEMDAN, BP neural network, vital signs signal

**Conference Title :** ICR 2022 : International Conference on Radar

**Conference Location :** Istanbul, Türkiye

**Conference Dates :** September 27-28, 2022