

论文

中频通信信号信噪比的快速盲估计

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摘要

信噪比是通信信号处理中的一个重要参数, 许多算法都以它作为先验信息来获取最佳性能。该论文通过确定中频通信信号的频谱范围来计算信号能量, 进而根据定义估计信噪比, 由此提出了一种中频通信信号的信噪比快速盲估计方法。对BPSK, QPSK, 16QAM等常用线性调制通信信号的仿真表明: 该方法性能稳定, 在数据样点长度为4096且信噪比变化范围为-5 dB到25 dB时, 估计值的偏差和均方根误差基本都小于0.5 dB。与基于特征值分解的方法相比, 在得到精确估计结果的同时具有计算复杂度小、适应动态范围广等优点。

关键词 [信息处理技术](#) [通信信号](#) [盲估计](#) [信噪比](#)

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Fast Blind SNR Estimation of IF Communication Signals

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Abstract

SNR (Signal-to-Noise Ratio) is an important parameter in communication signal processing and many algorithms need this information to obtain optimal performance. Firstly, signal power is calculated by determining spectral domain of Intermediate Frequency (IF) communication signal. Then, SNR is estimated according to its definition. Therefore, a fast blind SNR estimation algorithm is put forward for IF communication signals without any prior knowledge. Computer simulations are performed for the commonly used linear modulated communication signals, such as BPSK, QPSK, and 16QAM. Simulation results indicate that the algorithm is robust with estimated bias and root mean square error almost within 0.5dB when data length is 4096 and true SNR varies in the range from -5dB to 25dB. Compared with eigenvalue decomposition method, the proposed algorithm can achieve accurate estimation with low computational complexity and wide dynamic range.

Key words [Information processing technology](#) [Communication signals](#) [Blind estimation](#) [SNR](#)

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