System and method for detecting a narrowband signal

Laurel H Carney, Ph.D.

Invention

Most present detection algorithms for narrowband signals require modeling of the properties of the noise involved. This requires either prior knowledge of the properties of a stationary noise or a running estimate of the properties of a fluctuating noise. This invention presents a novel strategy for improved detection of narrowband signals in fluctuating wideband noise by combining information across two frequency channels straddling the signal frequency. This avoids the need to model the noise, simplifying the algorithm.

Technology

U.S. Patent No. 7,042,221

Two narrowband filters straddle the signal frequency and are followed by saturating nonlinearities. The phases of the filter transfer functions differ by 180º at the frequency of the signal. The saturating nonlinearity serves to "clip" the amplitude fluctuations of the filter responses without affecting the times of the zero-crossings, reducing interference due to fluctuating amplitudes. The saturated outputs are inputs into a running cross-correlator. The presence of a narrowband signal in the frequency being monitored results in a decrease in the output of the running cross-correlator, which can indicate a signal's presence once a threshold is reached.

Applications

- Monitoring for narrowband signals with known frequencies in the presence of wideband noise
- Enhancing quality of signals in noise through integration with signal-processing algorithms

Advantages

- Displays increased sensitivity of detection of narrowband signals in fluctuating wideband noise
- Uses simpler algorithm
- Does not require prior knowledge of the properties of the noise or of the signal phase
- Does not require long-term temporal stationarity

Syracuse University actively seeks to partner with businesses for purposes of building expertise, expanding your IP portfolio, licensing, and other opportunities for university/industry collaboration.

SYRACUSE UNIVERSITY
TECHNOLOGY TRANSFER

Please reference SU 100276
2-222 CST
Syracuse, NY 13244
315-443-5196

Jeong Han Oh
Director
jhoh@syr.edu