Low-cost spectrum sensor for ultra-narrowband transmissions

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Spectrum sensing

Part of electromagnetic radiation useful for radio communications. At a certain time and frequency, is there a transmission or not?

frequency from 3 kHz ... to 300 GHz

- FM radio
- television
- Wi-Fi
- LTE
Ultra-narrowband transmissions

Radio technology for:
• short, infrequent transmissions,
• low-power devices,
• very dense networks.

bandwidth \~100 \text{ Hz}
bitrate \~100 \text{ bit/s}
transmission time \~1 \text{ s}
BPSK or GFSK modulation
SNE-ESHTER: a low-cost sensor

- UHF receiver, optimized for spectrum sensing.
- Own hardware design based on off-the-shelf components.
- Low complexity signal detection algorithms suitable for usage on microcontrollers.
- Covariance-based detection, eigenvalue-based detection, ...