

**Scheduling of Collaborative Sequential Compressed Sensing Over Wide Spectrum Band**

**Abstract:**

The cognitive radio (CR) technology holds promise to significantly increase spectrum availability and wireless network capacity. With more spectrum bands opened up for CR use, it is critical yet challenging to perform efficient wideband sensing. We propose an integrated sequential wideband sensing scheduling framework that concurrently exploits sequential detection and compressed sensing (CS) techniques for more accurate and lower-cost spectrum sensing. First, to ensure more timely detection without incurring high overhead involved in periodic recovery of CS signals, we propose smart scheduling of a CS-based sequential wideband detection scheme to effectively detect the PU activities in the wideband of interest. Second, to further help users under severe channel conditions identify the occupied sub-channels, we develop two collaborative strategies, namely, joint reconstruction of the signals among neighboring users and wideband sensing-map fusion. Third, to achieve robust wideband sensing, we propose the use of anomaly detection in our framework. Extensive simulations demonstrate that our approach outperforms peer schemes significantly in terms of sensing delay, accuracy and overhead.