Journal watch
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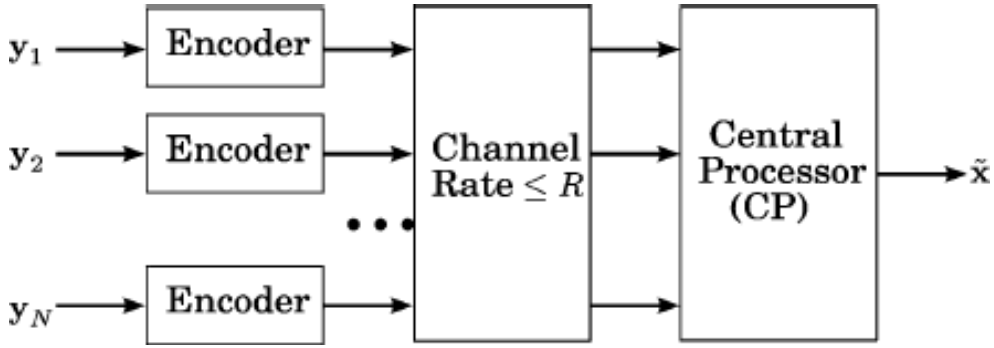
Title: Location Estimation of a Random Signal Source Based on Correlated Sensor Observations.
Authors: Ashok Sundaresan and Pramod K. Varshney.
Affiliations: Syracuse University, Syracuse.

- Proposes approximation of the joint likelihood function and computation of MLE using the theory of copulas.
- Copula: General way of formulating a multivariate distribution on marginal uniform random variables.
- Presents MLE based approach for location estimation assuming only the knowledge of the marginal likelihoods of the sensor observations.
- Main contributions of the paper: Copula based approximation of the joint likelihood function to perform MLE and improving the overall performance by fusing location estimates resulting from use of different copula functions.

Title: Distributed Estimation and Coding: A Sequential Framework based on a Side-Informed Decomposition

Authors: Chao Yu, Gaurav Sharma
Affiliations: University of Rochester, NY.



- Design encoder at the sensor and decoder at the CP to minimize the MSE of the estimate.
- Existing source coding technique yield suboptimal performance.
- Develop a decomposition and encoder implementation to address the above. Leads to a sequential implementation.
- Develop a side-informed codec using conditional KLT and scalar side informed code, Wyner-Ziv code and compare the achievable rate-distortion bound for the proposed sequential approach.

Title: Collaborative Spectrum Sensing in the Presence of Byzantine Attacks in Cognitive Radio Networks
Authors: Ankit Singh Rawat, Hao Chen, Pramod K. Varshney
Affiliations: Ankit Singh Rawat, Priyank Anand: IIT Kanpur, India; Hao Chen, Pramod K. Varshney: Syracuse University, Syracuse.

- Analyze the performance limits of collaborative spectrum sensing under Byzantine Attacks.
- Introduces the concept of Collaborative Spectrum sensing. Uses the classical parallel data fusion model in distributed detection.

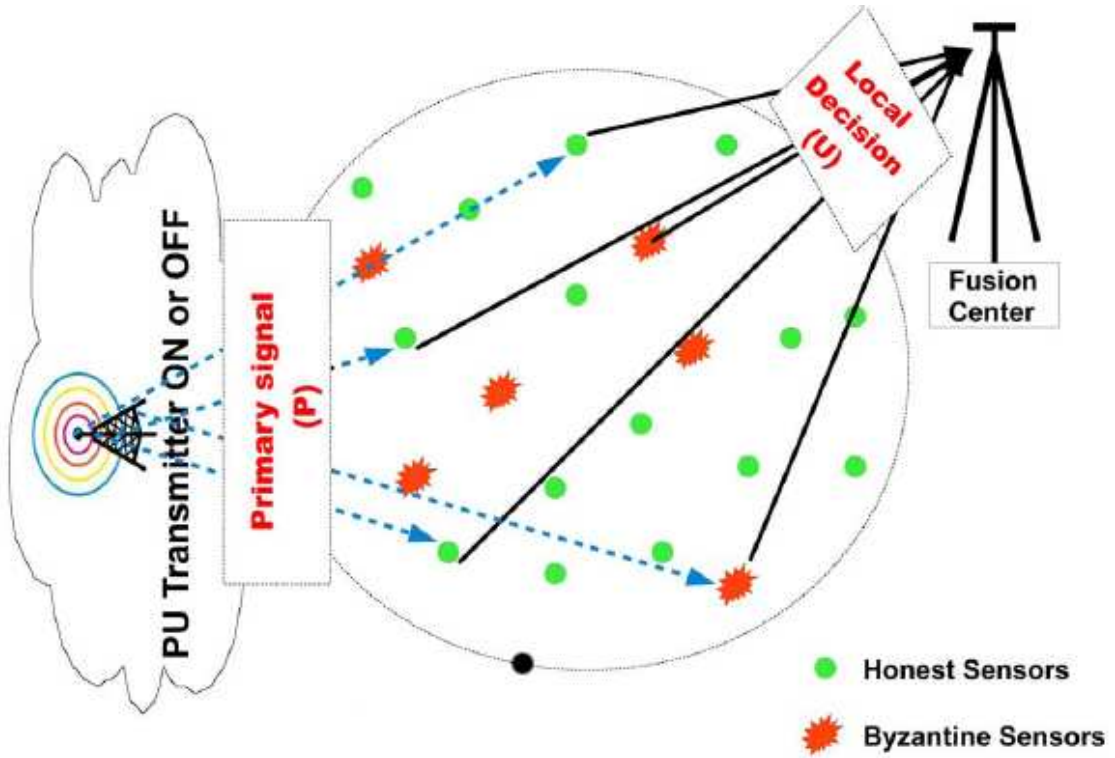


Fig. 1. CRN model where CRs receive signal (P_r) and decide about the presence of the Primary Transmitter and then send a one-bit decision to the Fusion center where the final decision is made. Byzantine attackers may send wrong decisions to degrade the fusion performance.

- Security threats on Collaborative Spectrum sensing, 1. Incumbent Emulation, 2. Spectrum Sensing Data Falsification (Byzantine attacks).
- This paper considers the Byzantine attackers. This work is shown to be a generalization of the work presented in ‘Distributed detection in the Presence of Byzantine attack’ by L. Tong et al.
- Byzantine CR collaborate amongst themselves to improve their knowledge. Propose optimal attacking strategies.
- As a solution, efficient and fast detection schemes to identify the Byzantine attackers has been proposed.

Title: Robust Beamforming for Security in MIMO Wiretap Channels with Imperfect CSI
Authors: Amitav Mukherjee and A. Lee Swindlehurst
Affiliation: University of California, Irvine.

- Investigates methods for reducing the likelihood that a message transmitted between 2 multiantenna nodes is intercepted by an undetected eavesdropper.
- Approach used here: Minimize the transmit power while satisfying the QoS requirement (SINR used here) at the receiver and use the remaining resources to transmit an artificial interference signal that jams the eavesdropper.
- Develop robust schemes that are insensitive to CSI errors.
- Beamforming used here instead of Spatial Multiplexing since beamforming optimal for small channel perturbations.

Title: Bayesian and Hybrid Cramer-Rao bounds for the Carrier Recovery Under Dynamic Phase Uncertain Channels
Authors: J Yang, Benoit Geller and Stephanie Bay
Affiliations: J Yang, Benoit Geller: UEI ENSTA, ParisTech, S Bay: ENS Cachan, France

- Study of Bayesian and Hybrid Cramer Rao bounds for code aided, data aided and non-data aided dynamical phase estimation of QAM signals.
- Most of the previous work are related to estimation of constant phase and frequency. CRBs for such a scenario is derived for CA, DA and NDA scenarios.
- In high rate communication systems there is a need to estimate time varying phase noise due to oscillator instabilities. Data aided CRB for frequency offset estimation and BCRB for NDA BPSK with dynamical phase offset have been studied.
- Main contributions of the paper: Show that exact calculation of HCRB is theoretically NP hard and hence, use BCJR code for approximate computation. Provide bounds for all the scenarios for offline and online computations.