Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science

6.432 Stochastic Processes, Detection and Estimation

Recitation 10 Outline

April 14, 2004

Binary Detection in White Gaussian Noise

1. Discrete time binary detection
    - Relation to standard multivariate Gaussian detection problem
    - Interpretations: correlator and matched filter
    - Performance analysis
2. Continuous time binary detection
    - Review of results from lecture
    - Performance analysis: energy versus correlation

Detection and Estimation in Colored Gaussian Noise

1. General procedure
    - Find an invertible whitening transformation
    - Reduce observations to vector form via a Karhunen–Loeve expansion
    - Disregard uninformative samples ("indifferent statistics")
    - Apply standard multivariate estimation or detection theory
    - Invert whitening transformation (shaping filter) if needed
2. Discussion of potential problems with this procedure
3. Example: Estimation in Brownian motion