

EC3410

Road map

(1) To present concepts of statistical signal processing

(2) To use these concepts

- to estimate signal characteristics
- to detect signal in noise
- to recover signal from noise
- to consider various types of applications

(3) To clear the path for modeling, adaptive filtering and spectral estimation (EC4440)

Random concepts review (I)

Random variable, random vector
pdf, central limit theorem,
covariance/correlation matrices

Apply to random data



Random processes (II)

random signal, statistical characterization of
random signals, random process properties,
correlation function and matrices for stationary
signals (definition & properties), frequency
domain description for stationary processes,
DKLT

Effect of LTI systems on random data



Linear transformations (III)

System input/output correlation relationships (time
& frequency domain)

Signal detection in noisy environments (Matched
filter); signal estimation in noisy environments
(FIR Wiener filter)