

0 Introduction

Professor: Nam Tran

0.1 Topics

- (0) Introduction
- (1) Overview of Random Variables
 - Random signals
- (2) Filtering of Random Signals
 - Filtering is effectively convolution - how can we apply a convolution to a function without known exact output (i.e. a random signal)?
- (3) Estimation Theory
- (4) Power Spectral Density Estimation
- (5) Wiener Filter Theory
- (6) Linear Estimator / Adaptive Linear Filter
- (7) Channel Equalisation
- (8) Image Processing

Lectures will not be recorded.

No material will be taught in week 12 (per plan).

0.2 Assessment

Component	Timing	Weight	Topic
Assignment 1	Week 5	15%	Topic (4)
Assignment 2	Week 8/9	15%	Topic (6)
Assignment 3	Week 12	20%	Topic (8)
Final Exam		50%	

1 Review of Random Variables

Random Variable: Numerical description of the outcome of an experiment

Sample Space: All possible values of an RV **Sample Point:** One possible

value of an RV

If the sample space takes form $\{x_1, x_2, x_3, \dots, x_N\}$ we have a *discrete* RV.