**Assignment 3**

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# Part One

## 1.1 Gram-Schmidt Orthogonalization

//Draw the 2 bases.

[كلام بسيط]

Figure Φ1 VS time after using the GM\_Bases function

Figure Φ2 VS time after using the GM\_Bases function

## 1.2 Signal Space Representation

Here we represent the signals using the base functions.

//Draw the signal using the space vectors and mark the space vector values in the graph and connect the vector with the origin in a straight line

Figure Signal Space representation of signals s1,s2

## 1.3 Signal Space Representation with adding AWGN

-the expected real points will be solid and the received will be hollow

**Case 1**:

Figure Signal Space representation of signals s1,s2 with E/σ¬2 =10dB

**Case 2**:

Figure Signal Space representation of signals s1,s2 with E/σ¬2 =0dB

**Case 3**:

Figure Signal Space representation of signals s1,s2 with E/σ¬2 =-5dB

## 1.4 Noise Effect on Signal Space

//comment on the effect of the noise

# Appendix A: Codes for Part One:

## A.1 Code for Gram-Schmidt Orthogonalization

## A.2 Code for Signal Space representation

## A.3 Code for plotting the bases functions

## A.4 Code for plotting the Signal space Representations

## A.5 Code for effect of noise on the Signal space Representations