PULSE WIDTH MODULATION (PWM)

EEEN 464 – DIGITAL COMMUNICATION SYSTEMS

Wednesday, 11 June 2025

MATLAB CODE FOR PULSE WIDTH MODULATION (1)

```
clc;
clear all;
t = 0:0.001:1;
fc = input('Enter the Frequency of Carrier Signal (Sawtooth) = ');
fm = input('Enter the Frequency of Message Signal (Sinusoidal) = ');
a = input('Enter the Amplitude of Carrier Signal = ');
b = input('Enter the Amplitude of Message Signal(should be < Carrier) = ');
vc = a.*sawtooth(2*pi*fc*t);
vm = b.*sin(2*pi*fm*t);
n = length(vc);
for i = 1:n
   if (vm(i)>=vc(i))
      pwm(i) = 1;
   else
      pwm(i) = 0;
   end
end
```

MATLAB CODE FOR PULSE WIDTH MODULATION (2)

```
subplot(3,1,1);
plot(t,vm,'black');
xlabel('Time ----->');
ylabel('Amplitude ----->');
title('Message Signal');
legend('Message Signal ---->');
grid on;
subplot(3,1,2);
plot(t,vc);
xlabel('Sample ----->');
ylabel('Amplitude ----->');
title('Carrier Signal');
legend('Carrier Signal ---->');
grid on;
```

MATLAB CODE FOR PULSE WIDTH MODULATION (3)

```
subplot(3,1,3);
plot(t,pwm,'red');
xlabel('Sample ----->');
ylabel('Amplitude ----->');
title('PWM Signal');
legend('PWM Signal ---->');
axis([0 1 0 2]);
grid on;
```

MATLAB CODE FOR PULSE WIDTH MODULATION (4)