

2.1 3

(2.1) (2.2) (2.3)

$$y = a + bt + ct^2 + dt^3 \tag{2.1}$$

$$y' = b + 2ct + 3dt^2 \tag{2.2}$$

$$y'' = 2c + 6dt \tag{2.3}$$

(2.1),(2.2),(2.3)

가

(Normalized equation)

DSP

1

1

가

(Normalized position profile)

가

(2.1) 3 (Boundary condition) 4 4 0

가 0 1 1 0 4

$$y(0) = 0, y(1) = 1, \tag{2.4}$$

$$y'(0) = 0, y'(1) = 0. \tag{2.5}$$

(2.1),(2.2)

$$a = 0, b = 0, \tag{2.6}$$

$$c + d = 1, 2c + 3d = 0. \tag{2.7}$$

$$y = 3t^2 - 2t^3 \tag{2.8}$$

(Normalized position equation)

DSP

(2.9)

(2.12)

$$y\left(\frac{t}{T}\right) = \left\{3\left(\frac{t}{T}\right)^2 - 2\left(\frac{t}{T}\right)^3\right\}S \tag{2.9}$$

$$y'\left(\frac{t}{T}\right) = \left\{\frac{6}{T}\left(\frac{t}{T}\right) - \frac{6}{T}\left(\frac{t}{T}\right)^2\right\}S \tag{2.10}$$

$$y''\left(\frac{t}{T}\right) = \left\{ \frac{6}{T^2} - \frac{12}{T^2} \left(\frac{t}{T}\right) \right\} S \tag{2.11}$$

$$y'''\left(\frac{t}{T}\right) = -\frac{12}{T^3} S \tag{2.12}$$

S , T .
 (ROM) ,
 (2.9) 3
 Matlab .
 Matlab (Normalized table) fopen fprintf
 (Text) .
 C .
 , DSP가 . 12
 , DSP
 TMS320C3X Floating Point DSP
 . 2.6
 Matlab Source 2.1 3 , 2.3 ~
 2.5 3 , , 가 .

Matlab Source 2.1

```

% 3th order motion profile generator
% Number of Table cell is 2048
% 2000. HanKim
    
```

```

clear;
i = 0;

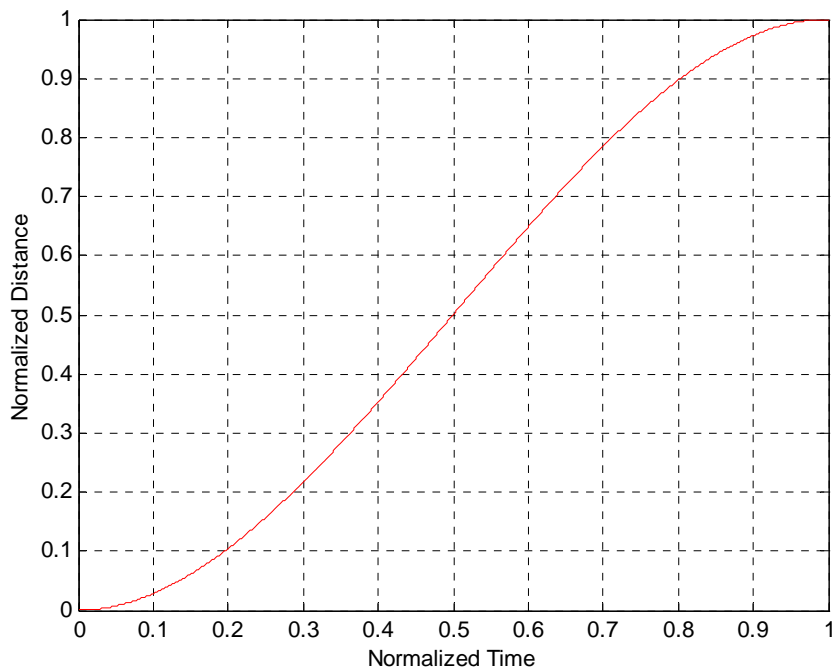
for i=1:2048,
    nt = i/2048;
    PTABLE(i) = 3*nt^2 - 2*nt^3;
    VTABLE(i) = 6*nt - 6*nt^2;
    ATABLE(i) = 6 - 12*nt;
end

x = ((1/2048):(1/2048):1)';
figure(1);plot(x,PTABLE,'r-');grid on;
    
```

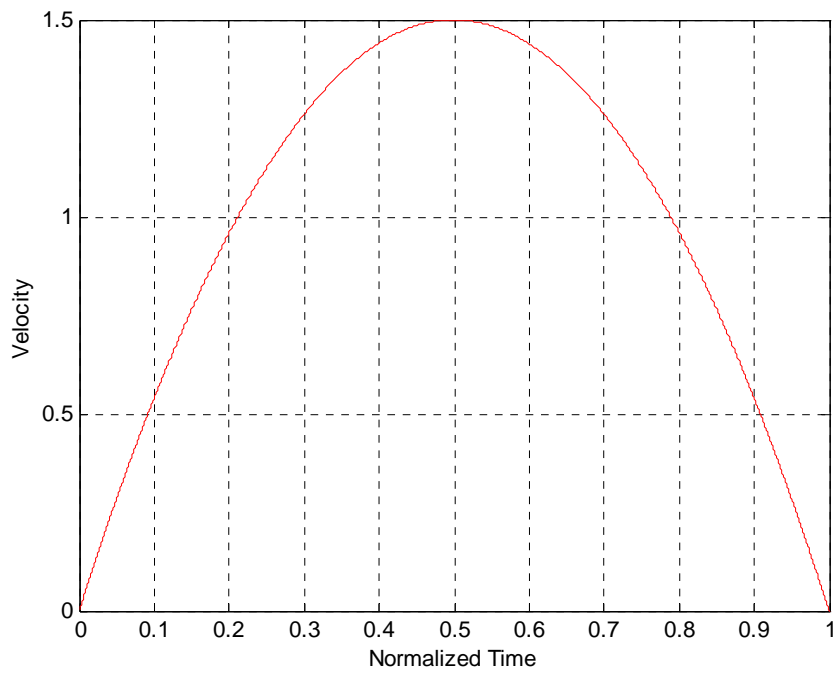
```
xlabel('Normalized Time');ylabel('Normalized Distance');
figure(2);plot(x,VTABLE,'r-');grid on;
xlabel('Normalized Time');ylabel('Normalized Velocity');
figure(3);plot(x,ATABLE,'r-');grid on;
xlabel('Normalized Time');ylabel('Normalized Acceleration');
```

```
fid = fopen('ptable.txt','w');
for j=1:512,
    i = j*4-3;
    fprintf(fid,'%13.12f, %13.12f, %13.12f, %13.12f, \n',
        PTABLE(i),PTABLE(i+1),PTABLE(i+2),PTABLE(i+3));
end
fclose(fid);
```

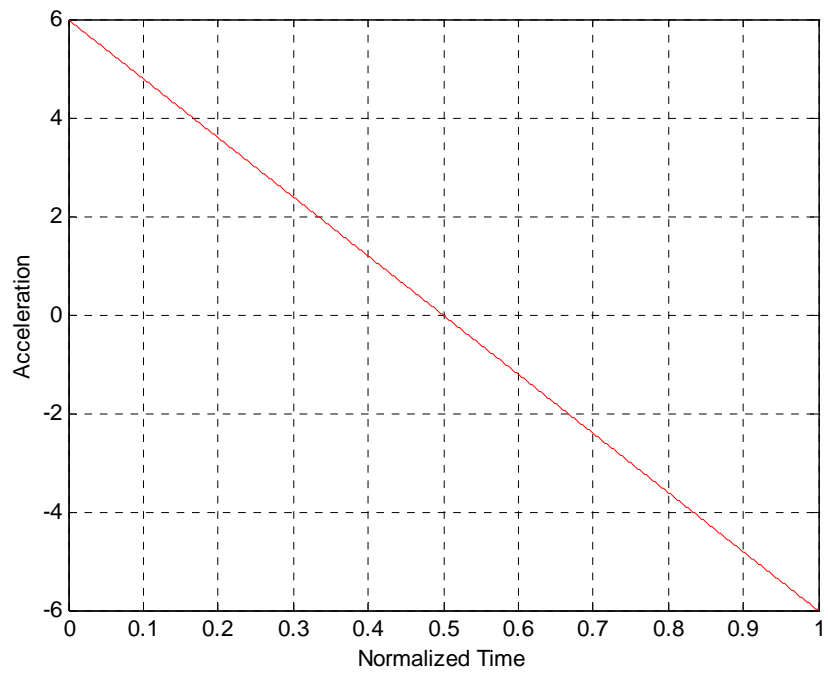
가 (4kHz), (Motion Table)
 , 가 3G
 2048 가
 , 가



[2.3] 3



[2.4] 3



[2.5] 3 가