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Z-axis angular velocity comparison

```
clc;
clear all;
% data from IUM sensor
A1 = [250.13 241.37 186.63 118.41 77.35 107.45 185.13 212.32 140.95 192.66
      227.52 177.49 120.71 23.85 21.41 179.66];
A2 = [189.79 189.78 188.89 180.71 191.57 201.4 180.58 112.18 113.86 23.47
      250.13 250.13 153.18 145.11 109.52 69.8];
A3 = [115.45 119.8 76.03 90.93 144.38 105.47 64.46 42.44 69.28 90.44 112.53
      177.69 171.02 160.25 158.85 175.13];

% True ground;
B1 = [204.95 243 231 196.04 249 243 190.1 123 83.17 115.84 144 204 160.4 168
      216.83 219];
B2 = [105 192 178.22 156 195 193.07 189 181.19 189 195 163.37 111 144 226.47
      255 258];
B3 = [57 96 124.75 120 118.81 86.11 63 103.96 144 108 41.53 51 75 86.14 117
      177];

x = 1:1:16;
for i=1:length(x)

    y1(i) = A1(i);
    y2(i) = B1(i);
    y3(i) = A2(i);
    y4(i) = B2(i);
    y5(i) = A3(i);
    y6(i) = B3(i);
end

subplot(3,1,1)
plot(x,y1,x,y2,'LineWidth',2);
title('Z-axis angular velocity comparison');
xlabel('time/sec')
ylabel('angular velocity')
legend('IUM sensor','True ground');

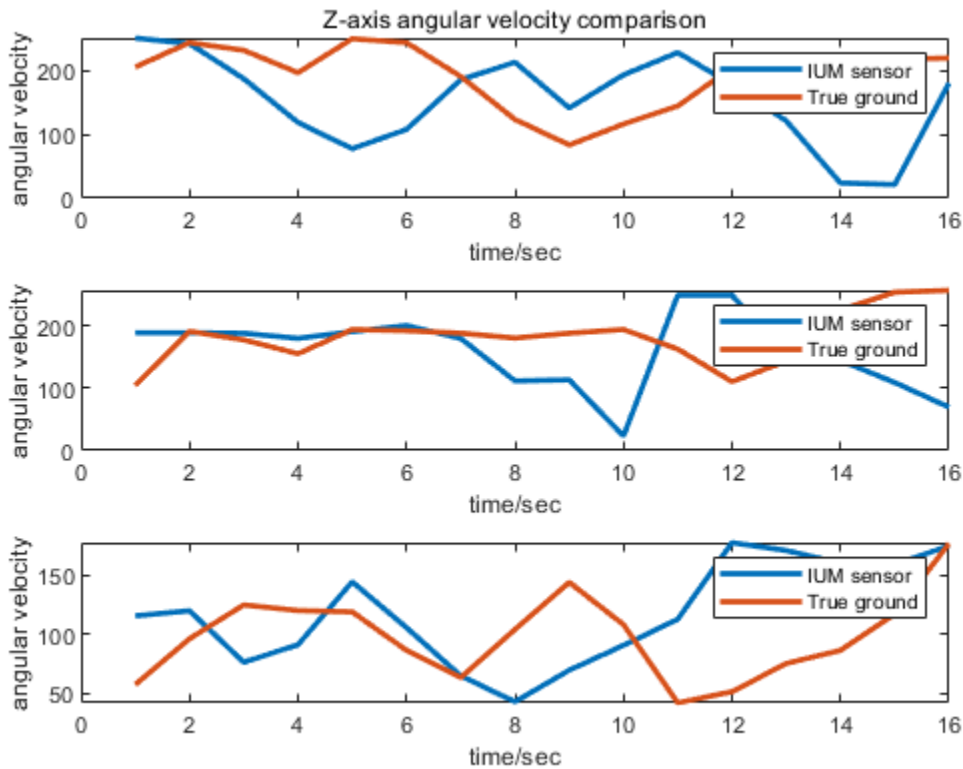
subplot(3,1,2)
plot(x,y3,x,y4,'LineWidth',2);
xlabel('time/sec')
```

```

ylabel('angular velocity')
legend('IUM sensor','True ground');

subplot(3,1,3)
plot(x,y5,x,y6,'LineWidth',2);
xlabel('time/sec')
ylabel('angular velocity')
legend('IUM sensor','True ground');

```



Y-axis angular velocity comparison

```

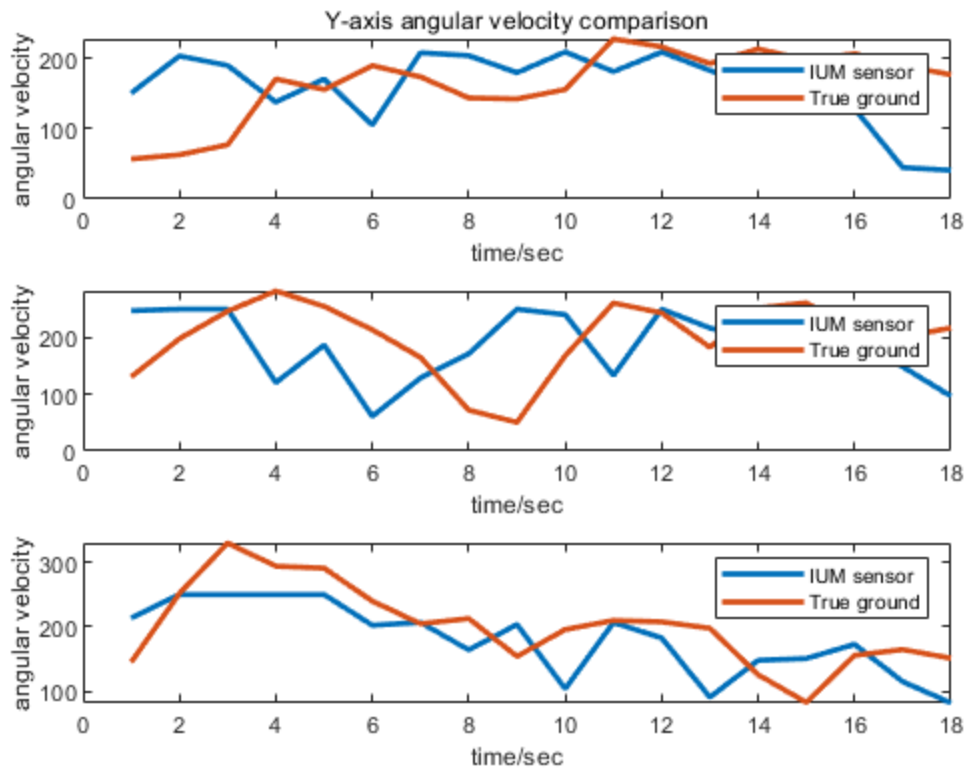
clc;
clear all;
% data from IUM sensor
A1 = [150.77 203.78 190.27 138 170.9 105.5 208.35 204.3 180.05 209.57 181.56
      209.34 183.2 158.37 134.52 128.66 44.82 40.9];
A2 = [247.43 250.13 250.13 120.6 186.7 61.09 128.86 171.37 250.13 240.5 133.27
      250.13 216.89 194.81 215.8 195.68 148.38 96.68];
A3 = [214.09 250.14 250.14 250.14 250.14 202.6 206.93 164.41 203.72 104.4
      206.78 183.08 91.17 148.39 151.12 173.12 115.24 82.28];

% True ground;
B1 = [57 63 77.23 171 156 190.1 174 144 142.57 156 228 216.83 193.07 213.86
      198 207 190.1 177];
B2 = [130.69 198 246.53 282.18 255 213.86 165 72 50.5 168 261 243.56 183 252
      261.39 210 201.98 216.83];

```

```
B3 = [145.54 252 330 294.06 291 240 204.95 213 154.46 196.04 210 207.92 198  
126 83.17 156 165 151.49];
```

```
x = 1:1:18;  
for i=1:length(x)  
  
    y1(i) = A1(i);  
    y2(i) = B1(i);  
    y3(i) = A2(i);  
    y4(i) = B2(i);  
    y5(i) = A3(i);  
    y6(i) = B3(i);  
end  
  
subplot(3,1,1)  
plot(x,y1,x,y2,'LineWidth',2);  
title('Y-axis angular velocity comparison');  
xlabel('time/sec')  
ylabel('angular velocity')  
legend('IUM sensor','True ground');  
  
subplot(3,1,2)  
plot(x,y3,x,y4,'LineWidth',2);  
xlabel('time/sec')  
ylabel('angular velocity')  
legend('IUM sensor','True ground');  
  
subplot(3,1,3)  
plot(x,y5,x,y6,'LineWidth',2);  
xlabel('time/sec')  
ylabel('angular velocity')  
legend('IUM sensor','True ground');
```



X-axis angular velocity comparison

```

clc;
clear all;
% data from IUM sensor
A1 = [108.36 125.66 159.33 180.47 154.57 210.5 154.3 180.5 211.59 163.61 164
      98.29 129.13 123.97 213.27 206.63];
A2 = [83.56 210.82 224.56 239.9 238.44 250.14 250.14 198.46 211.57 250.14
      245.6 205.89 85.16 25.14 187.66 123.89];
A3 = [121.27 250.13 185.68 211.11 250.13 250.13 250.13 250.13 207.71 114.04
      224.14 250.13 250.13 174.21 107.49 124.17];

% True ground;
B1 = [102 157.43 103.96 129 163.37 168 144 196.04 174 156 201.98 168 165
      136.63 109.9 77.23];
B2 = [42 176.47 222 228 258 291 276.24 180 240 258.15 237.62 204 124.75 222
      180 142.57];
B3 = [118.81 255 201 196.04 264 288.12 305.94 312 192 193.07 120 282.18 237
      173.53 114 102];

x = 1:1:16;
for i=1:length(x)

    y1(i) = A1(i);

```

```

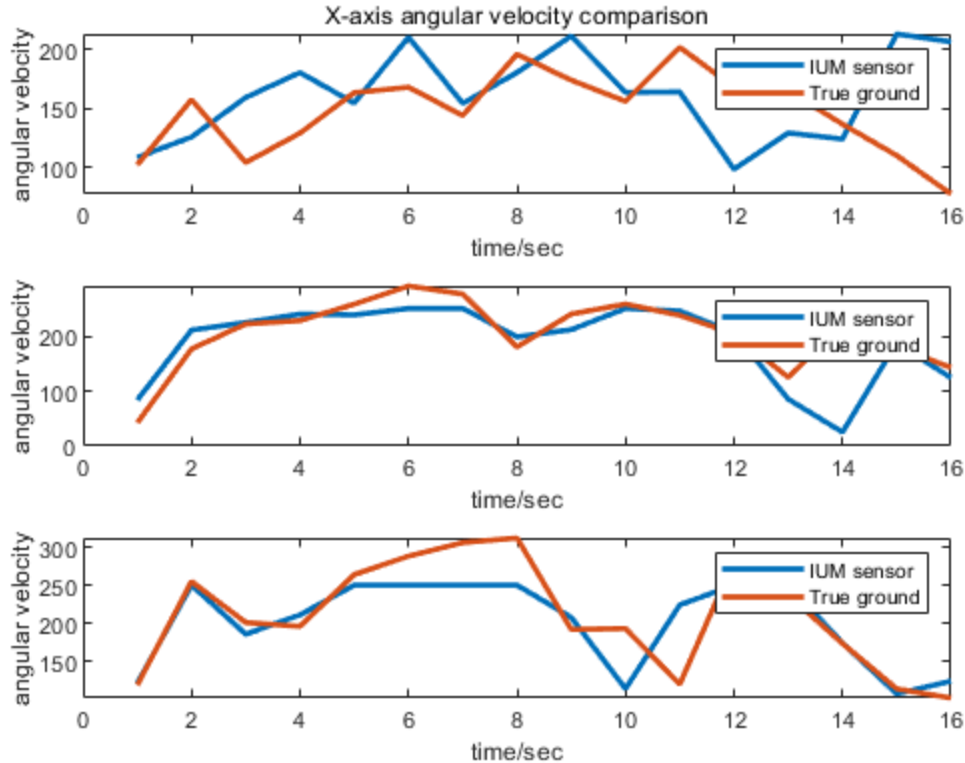
    y2(i) = B1(i);
    y3(i) = A2(i);
    y4(i) = B2(i);
    y5(i) = A3(i);
    y6(i) = B3(i);
end

subplot(3,1,1)
plot(x,y1,x,y2,'LineWidth',2);
title('X-axis angular velocity comparison');
xlabel('time/sec')
ylabel('angular velocity')
legend('IUM sensor','True ground');

subplot(3,1,2)
plot(x,y3,x,y4,'LineWidth',2);
xlabel('time/sec')
ylabel('angular velocity')
legend('IUM sensor','True ground');

subplot(3,1,3)
plot(x,y5,x,y6,'LineWidth',2);
xlabel('time/sec')
ylabel('angular velocity')
legend('IUM sensor','True ground');

```



Z-axis acceleration comparison

```
clc;
clear all;
% data from IUM sensor
A1 = [1.3 0.88 0.94 0.92 0.91 0.89 0.49 0.86 0.9 0.91 1.04 0.89 0.86 0.88 0.88
      0.91];
A2 = [0.86 0.95 0.94 0.99 0.92 0.91 0.9 0.81 0.78 0.91 0.87 0.9 0.91 0.88 0.9
      0.91];
A3 = [0.9 0.86 0.89 0.89 0.93 0.9 0.86 0.9 0.9 0.91 0.88 0.92 0.73 0.86 0.9
      0.92];

% True ground;
B1 = [0.21 0.01 0.02 0.14 0.07 0.17 0.07 0.07 0.04 0.13 0.14 0.08 0.12 0.02
      0.07 0.02];
B2 = [0.01 0.01 0.01 0.08 0.02 0.11 0.01 0.13 0.02 0.02 0.11 0.04 0.01 0.01
      0.03 0.01];
B3 = [0 0.21 0.02 0.01 0.01 0.05 0.03 0.01 0.1 0.11 0.02 0.03 0.07 0.01 0.14
      0.08];

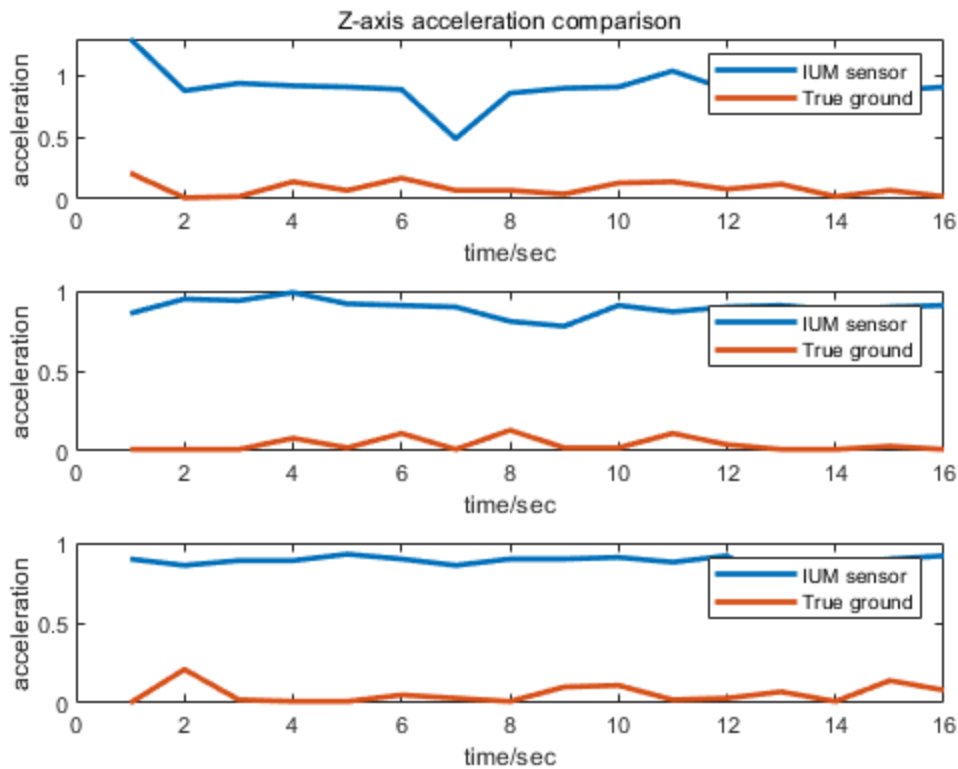
x = 1:1:16;
for i=1:length(x)

    y1(i) = A1(i);
    y2(i) = B1(i);
    y3(i) = A2(i);
    y4(i) = B2(i);
    y5(i) = A3(i);
    y6(i) = B3(i);
end

subplot(3,1,1)
plot(x,y1,x,y2, 'LineWidth',2);
title('Z-axis acceleration comparison');
xlabel('time/sec')
ylabel('acceleration')
legend('IUM sensor','True ground');

subplot(3,1,2)
plot(x,y3,x,y4, 'LineWidth',2);
xlabel('time/sec')
ylabel('acceleration')
legend('IUM sensor','True ground');

subplot(3,1,3)
plot(x,y5,x,y6, 'LineWidth',2);
xlabel('time/sec')
ylabel('acceleration')
legend('IUM sensor','True ground');
```



Y-axis acceleration comparison

```

clc;
clear all;
% data from IUM sensor
A1 = [1.05 0.91 1.06 0.85 0.94 0.97 1.05 1.06 0.99 1 0.98 1.03 1.03 1.01 0.99
      1.01 1.02];
A2 = [0.97 0.92 0.91 0.84 1.06 1.01 1.07 0.95 1.04 1.14 0.94 1.07 0.98 1.03
      0.99 1.01 0.99];
A3 = [0.95 0.91 0.99 1 0.9 0.91 1.02 0.99 0.95 0.95 1 1 1 0.99 0.99 0.96
      1.04];

% True ground;
B1 = [0.08 0.13 0.03 0.01 0.02 0.09 0.03 0.1 0.04 0.07 0.11 0.17 0.04 0.03
      0.03 0.07 0.01];
B2 = [0.12 0.01 0.03 0.08 0.1 0.14 0.03 0 0.05 0.08 0.02 0.02 0.02 0.04 0.05
      0.09 0];
B3 = [0.22 0.07 0.01 0.02 0.05 0.03 0.01 0.01 0.12 0.05 0.016 0.18 0.14 0.06
      0.08 0.03 0.03];

x = 1:1:17;
for i=1:length(x)

    y1(i) = A1(i);

```

```

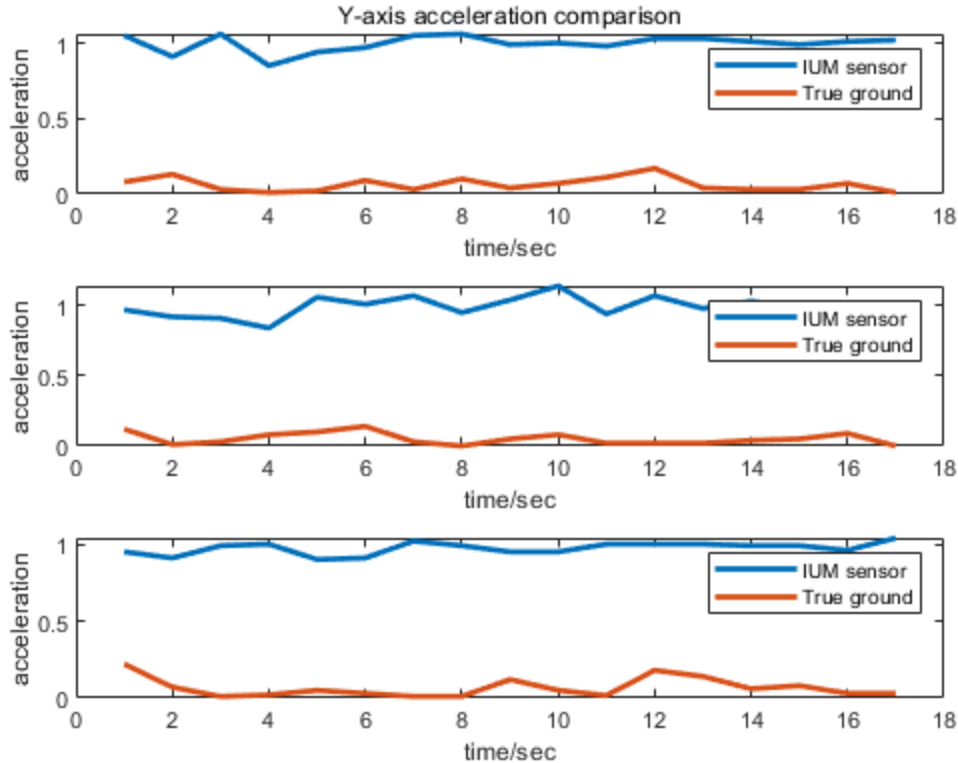
        y2(i) = B1(i);
        y3(i) = A2(i);
        y4(i) = B2(i);
        y5(i) = A3(i);
        y6(i) = B3(i);
    end

    subplot(3,1,1)
    plot(x,y1,x,y2,'LineWidth',2);
    title('Y-axis acceleration comparison');
    xlabel('time/sec')
    ylabel('acceleration')
    legend('IUM sensor','True ground');

    subplot(3,1,2)
    plot(x,y3,x,y4,'LineWidth',2);
    xlabel('time/sec')
    ylabel('acceleration')
    legend('IUM sensor','True ground');

    subplot(3,1,3)
    plot(x,y5,x,y6,'LineWidth',2);
    xlabel('time/sec')
    ylabel('acceleration')
    legend('IUM sensor','True ground');

```



X-axis acceleration comparison

```
clc;
clear all;
% data from IUM sensor
A1 = [1.02 1.07 1.05 1.11 0.96 0.81 0.96 1.02 1.03 1.04 0.92 1.08 1.05];
A2 = [0.99 0.96 1.18 1.13 0.98 1.07 0.99 0.95 0.98 1.1 0.93 1.01 1.03];
A3 = [0.98 1.04 1.06 1.01 1.03 1.08 1.01 0.93 1.03 1.02 1.15 1.24 1.02];

% True ground;
B1 = [0.09 0.07 0.01 0.03 0.02 0.05 0.01 0.02 0.05 0.07 0.05 0.08 0];
B2 = [0.05 0.05 0.03 0.12 0.03 0.05 0.05 0.1 0.04 0.09 0.16 0.02 0.11];
B3 = [0.01 0.1 0.19 0.1 0.07 0.15 0.04 0.22 0.08 0.17 0.01 0.07 0.07];

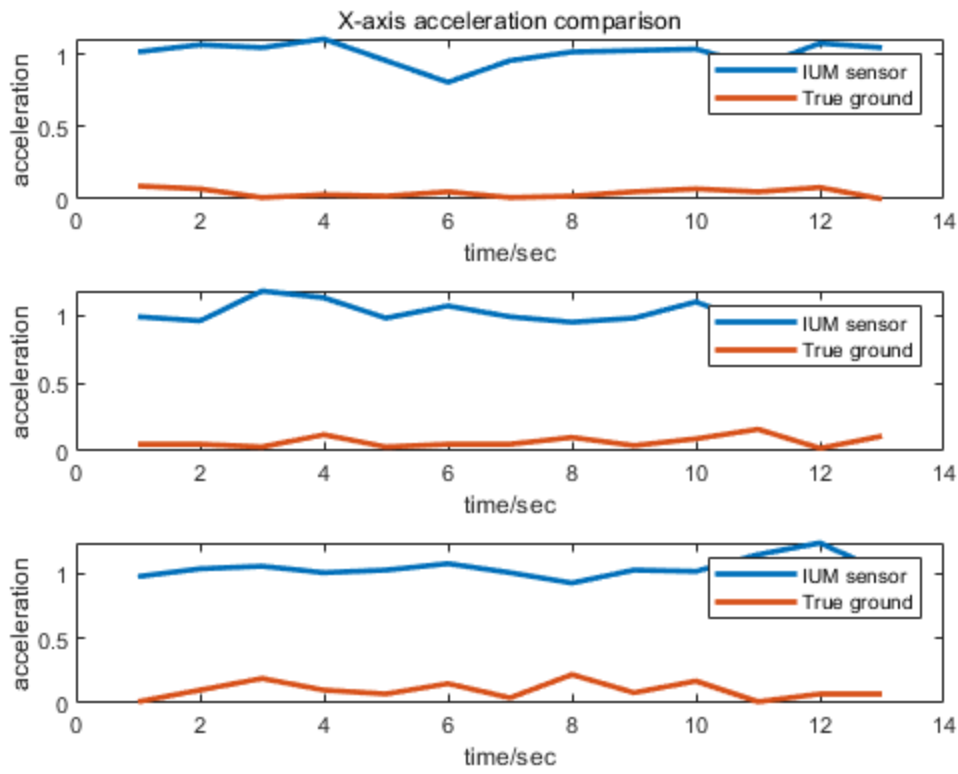
x = 1:1:13;
for i=1:length(x)

    y1(i) = A1(i);
    y2(i) = B1(i);
    y3(i) = A2(i);
    y4(i) = B2(i);
    y5(i) = A3(i);
    y6(i) = B3(i);
end

subplot(3,1,1)
plot(x,y1,x,y2,'LineWidth',2);
title('X-axis acceleration comparison');
xlabel('time/sec')
ylabel('acceleration')
legend('IUM sensor','True ground');

subplot(3,1,2)
plot(x,y3,x,y4,'LineWidth',2);
xlabel('time/sec')
ylabel('acceleration')
legend('IUM sensor','True ground');

subplot(3,1,3)
plot(x,y5,x,y6,'LineWidth',2);
xlabel('time/sec')
ylabel('acceleration')
legend('IUM sensor','True ground');
```



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