```
%% Connent arduino
 a = arduino()

%% Set-up servos
 s1 = servo(a, 'D9')
 s2 = servo(a, 'D10')

%% home postion
 hAng1=0.25;
 hAng2=0.25;

 writePosition(s1, hAng1);
 writePosition(s2, hAng2);

%% Read postion feedback
 volt1 = readVoltage(a, 'A0');
 pos1 = -6.5485*volt1 + 21.3486
 volt2 = readVoltage(a, 'A1');
 pos2 = -6.6503*volt2 + 21.3592

%% set mode
opMode = input('0 for stall at home position \n1 for to and fro mode \n2 for↙
collaborative mode \nenter opmode:');
pause(3);
% 0 for stall at home position
% 1 for to and fro mode
% 2 for collaborative mode

 if opMode==0       %hold at home position mode
    writePosition(s1, hAng1);
    writePosition(s2, hAng2);
    pause(4);
 elseif opMode==1   %to-and-fro motion mode
    %create emergency stop button to end loop
    ButtonHandle = uicontrol('Style', 'PushButton','String', 'Stop loop', ...
                        'Callback', 'delete(gcbf)');
    %reset to home position
    writePosition(s1, hAng1);
    writePosition(s2, hAng2);
    pause(3);

    while(1)
        if ~ishandle(ButtonHandle)
        disp('Loop stopped by user:');
        break;
        end
        pause(0.01);
        for i=0.25:0.05:0.725
            writePosition(s1,i);
            pause(0.25);
        end
```

```
        for i=0.25:0.05:0.75
            writePosition(s2,i);
            pause(0.25);
        end
        pause(1);
        for i=0.75:-0.05:0.25
            writePosition(s2,i);
            pause(0.25);
        end
        for i=0.725:-0.05:0.25
            writePosition(s1,i);
            pause(0.25);
        end
        pause(1);
  end

elseif opMode==2     %Assistance-as-required mode
   %reset to home position
   writePosition(s1, ang1);
   writePosition(s2, ang2);
   pause(4);
   while(1)
      state =0;
      % collect EMG data, signal process and get state output
      % state 0 - stall
      % state 1 - flexion
      % state 2 - extension
      volt1 = readVoltage(a, 'A0');
      pos1 = -6.5429*volt1 + 21.2651;
      volt2 = readVoltage(a, 'A1');
      pos2 = -6.5429*volt2 + 21.2651;
      ang1= 0.025*pos1+0.25;
      ang2= 0.025*pos2+0.25;
      if(state==0)
         continue;
      elseif(state==1)
           if pos2<hpos
               writePosition(s2, hAng2);
               continue;
           elseif pos1<19.5 && pos2 > hpos
              ang1=ang1+0.05;
              writePosition(s1, ang1);
              writePosition(s1, hAng2);
           elseif pos1>19.5 && pos2<19.5
              ang2=ang2+0.05;
              writePosition(s1, 0.75);
              writePosition(s2, ang2);
           elseif pos1>19.5 &&pos2>19.5
              pos1 = 19.9;
              pos2 = 19.9;
              continue;
```

```
            end
        elseif(state==2)
            if pos2<hpos-0.1
                writePosition(s2, hAng2);
                continue;
             elseif pos1<19.5 && pos2<hpos+0.05
                ang1=ang1-0.05;
                writePosition(s1, ang1);
                writePosition(s1, hAng2);
            elseif pos1>19.5 && pos2<19.5
                ang2=ang2-0.05;
                writePosition(s1, ang1);
                writePosition(s2, ang2);
            elseif pos1>19.5 &&pos2>19.5
                pos1 = 19.9;
                pos2 = 19.9;
                continue;
            end
        end

    end
 end

%% end of code
```