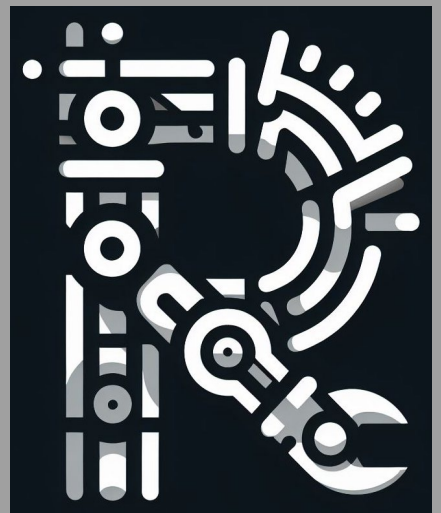
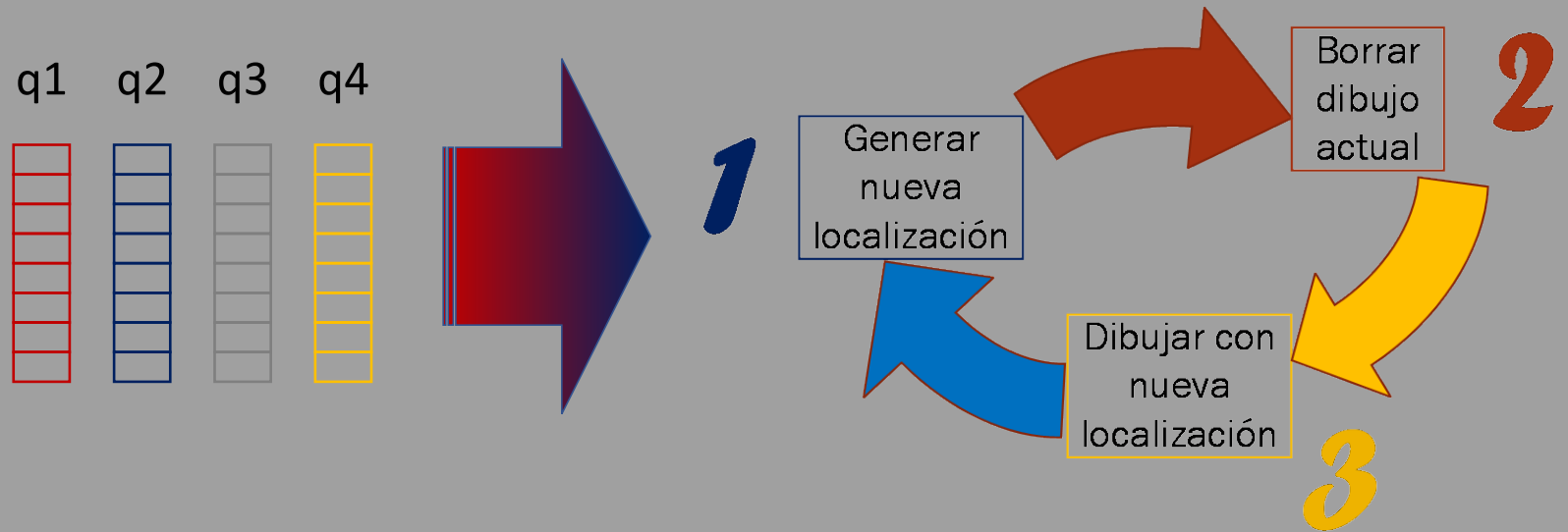
Animación de robots de acuerdo a los modelos cinemáticos y dinámicos



Animación de robots

Para hacer la animación de un robot, la lógica es la misma que para cualquier objeto 3D con los tres pasos básicos (generar nueva localización, borrar dibujo actual y dibujar con nueva localización).

En este caso, las localizaciones del robot vienen definidas por sus posiciones articulares q1, q2, q3 y q4, por lo que primero es necesario generar una secuencia de estas posiciones (mediante control cinemático y dinámico) para luego dibujar el robot en cada una de ellas dentro del bucle de la animación.

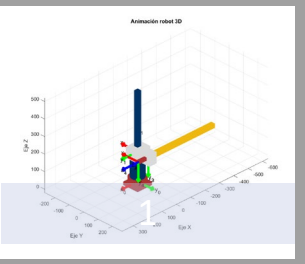


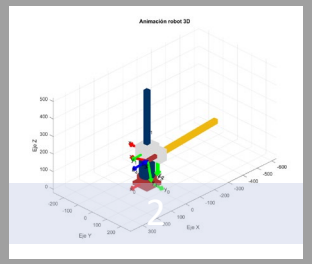
Ejemplo 1 animación robot

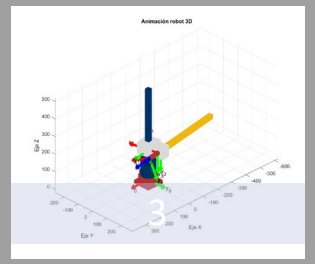
Código 1

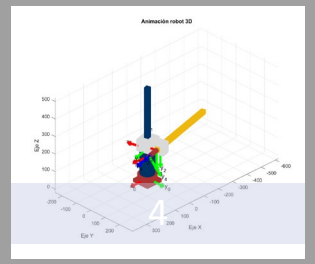
```
clear;
f1=figure(1);
set(gcf, 'WindowState', 'maximized'); %Se maximiza la figura
pause(0.1)
clf;
hold on;
grid on
axis equal
view(135,30)
light;
xlabel('Eje X');
ylabel('Eje Y');
zlabel('Eje Z');
title('Animación robot 3D');
nCuadros = 30; %-> Se define la cantidad de cuadros de animación
tFinal = 2;    %-> Se define la duración de la animación
dt = tFinal/(nCuadros-1); %-> Se calcula la duración de cada cuadro
q1=linspace(-90,45,nCuadros); %-> Se crea la secuencia de puntos
q2=linspace(0,300,nCuadros);  % de las 4 articulaciones, pueden
q3=linspace(0,350,nCuadros);  % generarse en base al control cinemático
q4=linspace(0,340,nCuadros);  % y dinámico
for i=1:nCuadros
    cla(f1) %-> Se borran todos los objetos en la figura
    dibujarRobot(q1(i),q2(i),q3(i),q4(i));
    pause(dt)
end
```

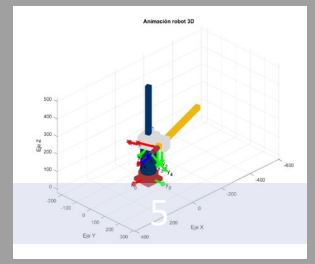
Ejemplo 1 animación robot

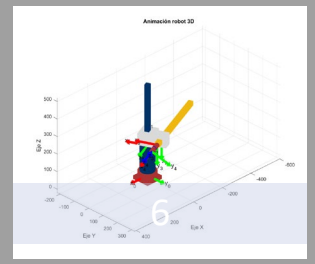


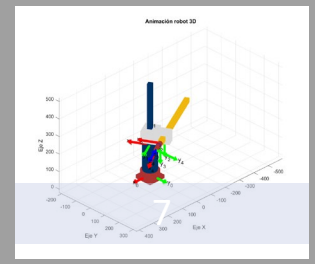


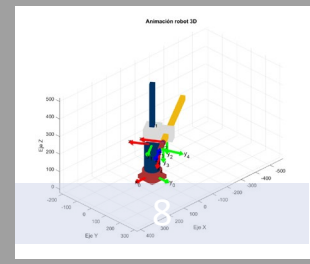


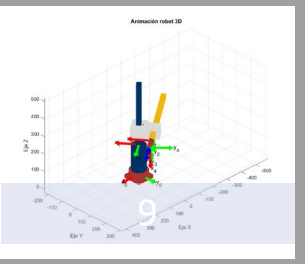


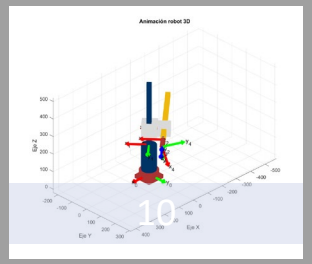


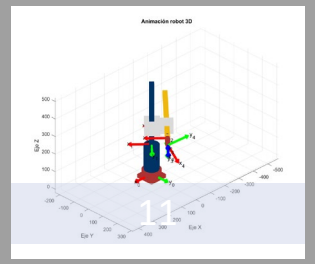


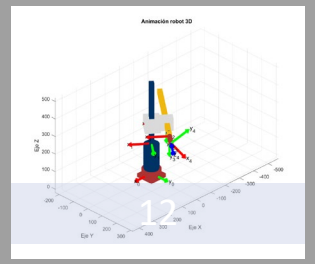


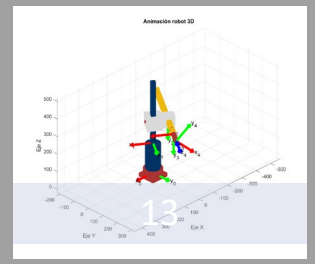


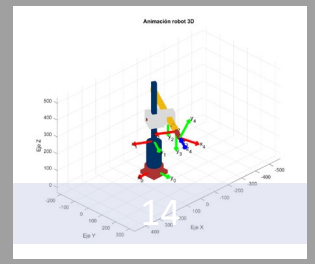


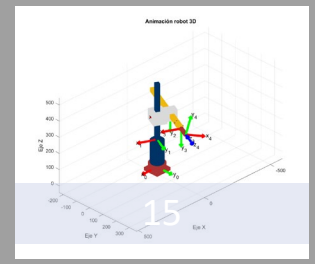


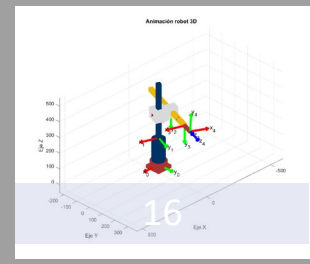


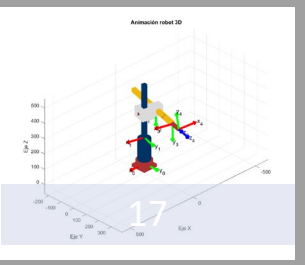


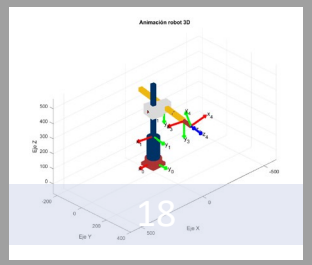


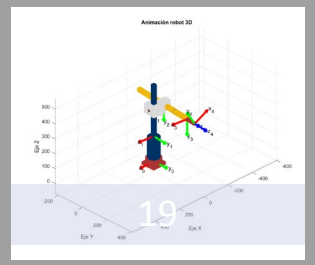


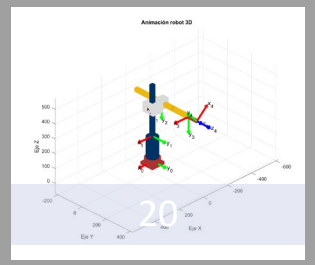


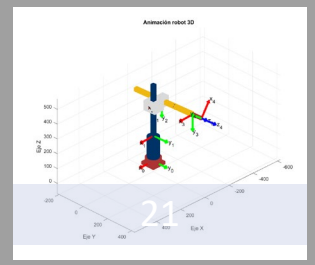


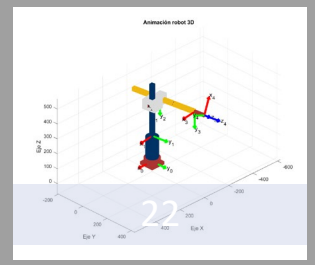


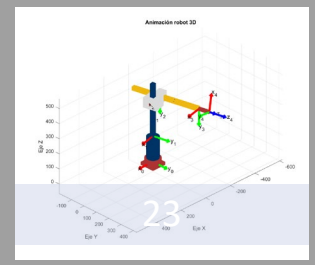


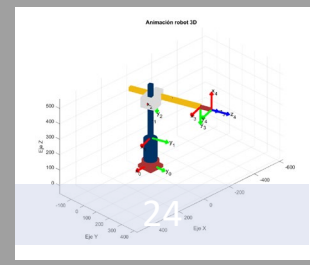


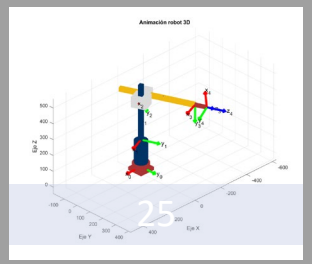


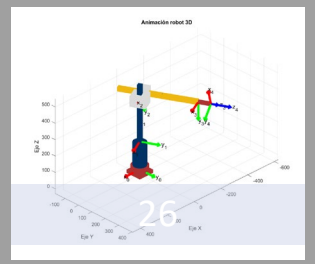


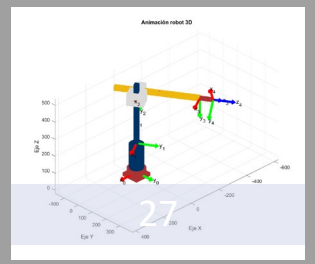


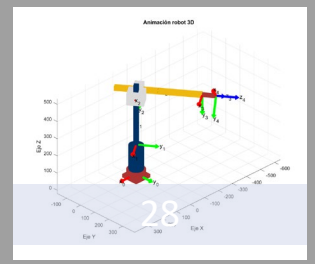


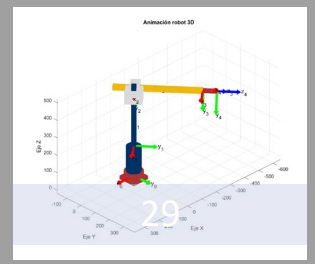


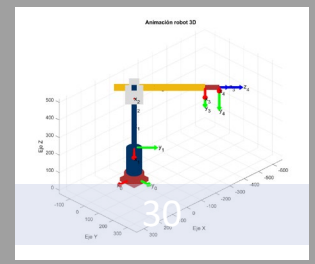










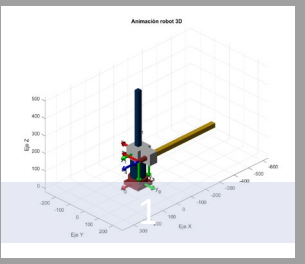


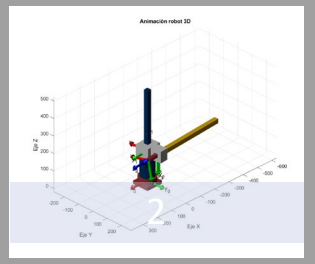
Ejemplo 2 animación robot

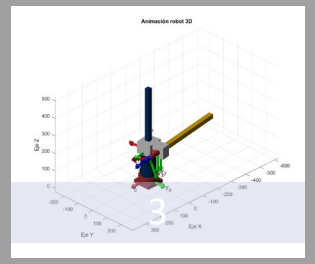
Código 2

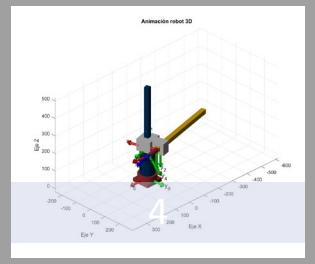
```
clear;
f1 = figure(1);
set(gcf, 'WindowState', 'maximized'); %Se maximiza la figura
pause(0.1);
clf;
hold on;
grid on;
axis equal;
view(135, 30);
light;
xlabel('Eje X');
ylabel('Eje Y');
zlabel('Eje Z');
title('Animación robot 3D');
nCuadros = 30; %-> Se define la cantidad de cuadros de animación
tFinal = 2;    %-> Se define la duración de la animación
dt = tFinal/(nCuadros-1); %-> Se calcula la duración de cada cuadro
q1=linspace(-90,45,nCuadros); %-> Se crea la secuencia de puntos
q2=linspace(0,300,nCuadros);  % de las 4 articulaciones, pueden
q3=linspace(0,350,nCuadros);  % generarse en base al control cinemático
q4=linspace(0,340,nCuadros);  % y dinámico
for i = 1:nCuadros
    if exist('robot') == 1
        delete(robot); %-> Se borra el robot en la figura
    end
    robot = dibujarRobot(q1(i), q2(i), q3(i), q4(i));
    pause(dt);
end
```

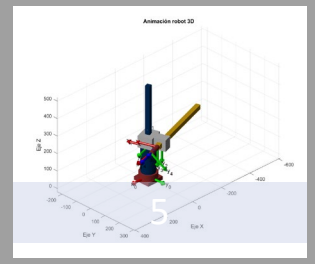
Ejemplo 2 animación robot

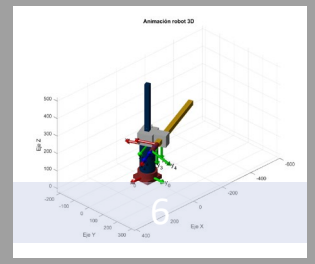


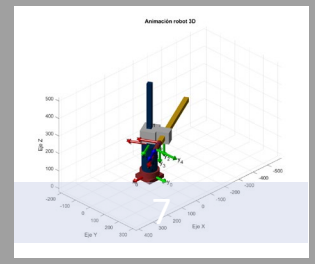


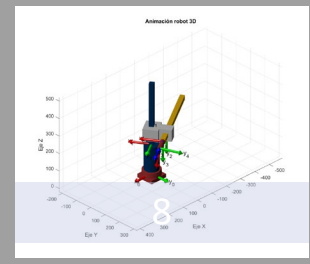


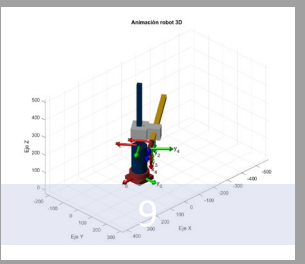


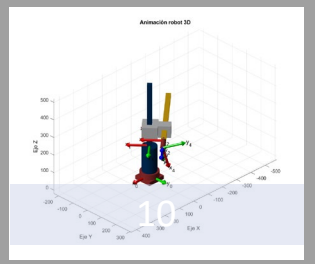


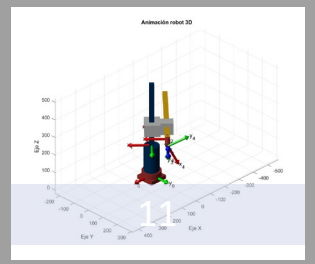


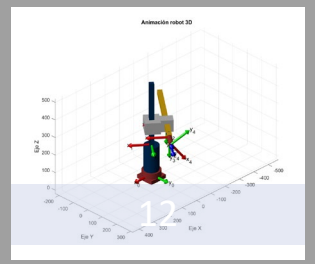


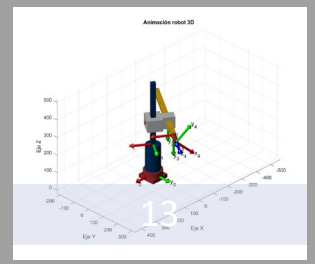


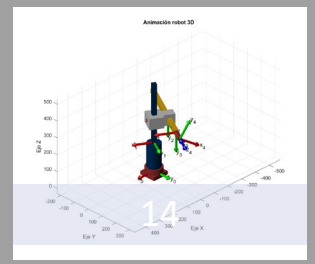


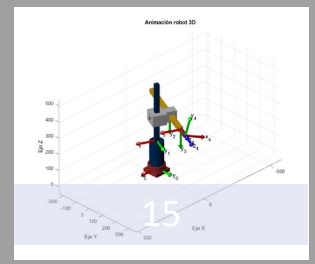


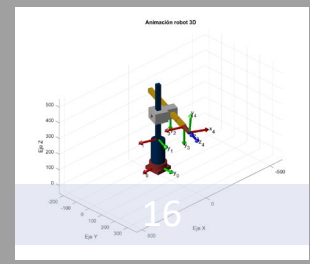


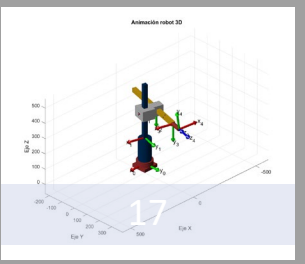


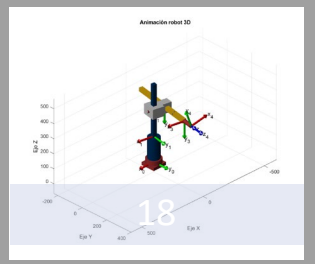


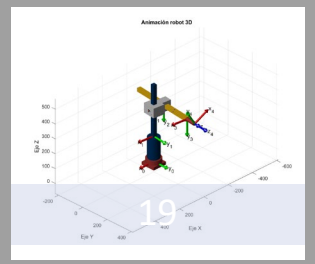


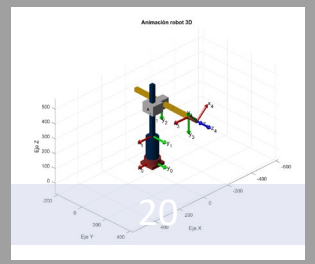


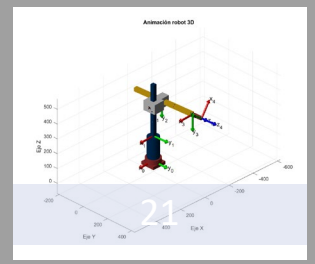


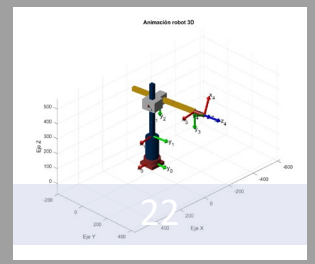


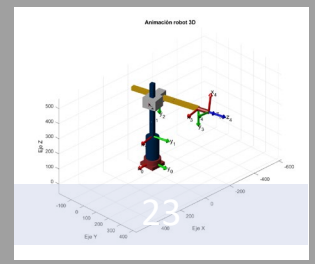


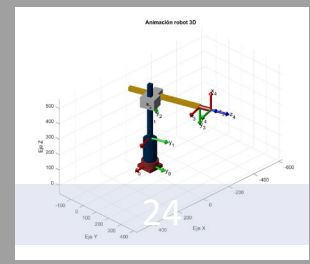


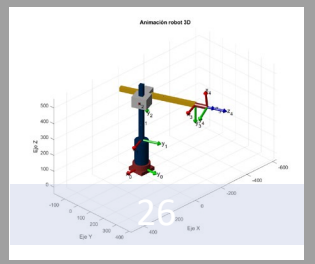


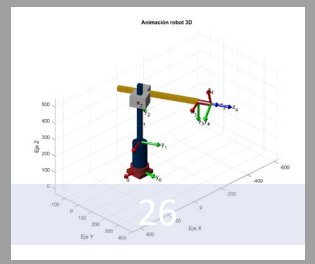


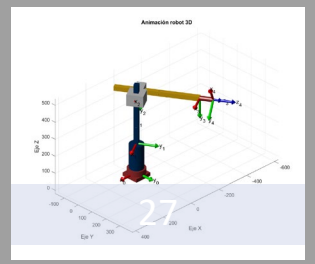


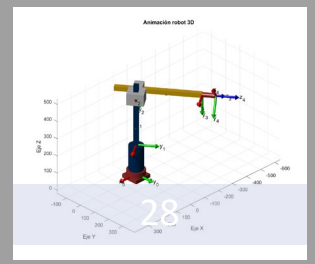


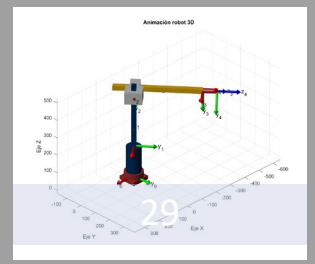


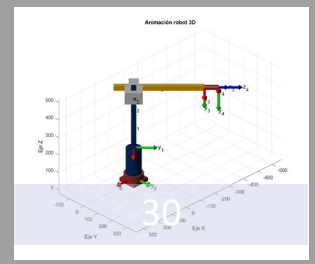












Formando **líderes** para la construcción de un nuevo **país en paz**