# Puma 'FKINE' and plot functions

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MatlaDrive Link: https://drive.matlab.com/sharing/49eb5fa6-0641-425c-a130-9cf41b2e1058

Deliver:

1. Assemble the  Robot  using the links of the puma, based on the STL parts given.
2. Let us try to animate some links

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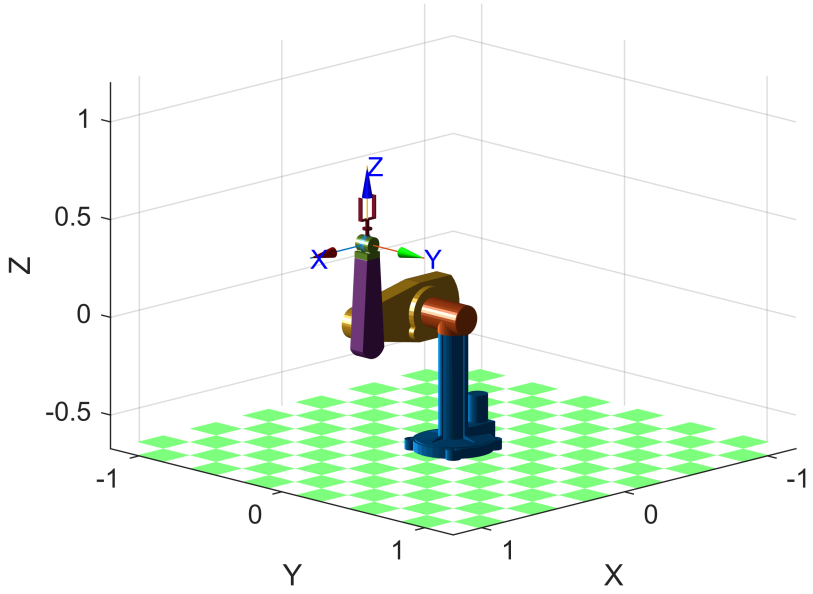
## Model to be followed

Use DH parameters from Standard convection of Puma560

```
mdl_puma560
p560.plot3d([0 0 0 0 0 0])
```

```
Loading STL models from ARTE Robotics Toolbox for Education  by Arturo Gil (http://arvc.umh.es/arte).......
```




```
p560
```

```
p560 =

Puma 560 [Unimation]:: 6 axis, RRRRRR, stdDH, slowRNE
 - viscous friction; params of 8/95;
+---+-----------+-----------+-----------+-----------+-----------+
| j |     theta |         d |         a |     alpha |    offset |
+---+-----------+-----------+-----------+-----------+-----------+
|  1|         q1|          0|          0|     1.5708|          0|
|  2|         q2|          0|     0.4318|          0|          0|
|  3|         q3|    0.15005|     0.0203|    -1.5708|          0|
|  4|         q4|     0.4318|          0|     1.5708|          0|
|  5|         q5|          0|          0|    -1.5708|          0|
|  6|         q6|          0|          0|          0|          0|
+---+-----------+-----------+-----------+-----------+-----------+
```

# Puma Links

## Initial variables

```
REF = [];
V = [];
F = [];
color = [[0 0 1]; [1 0 0]; [1 1 0]; [1 0 1]; [0 1 0]; [0 0 1]; [1 0 0]];
```

## Link 0

```
figure
```

```
[V(1), F(1), N, name]=stlRead('link0.stl');
```

```
Unable to perform assignment because the indices on the left side are not compatible with the size of the
 right side.
```

```
FVsPlot(F(1),V(1),color(1,:))
axis equal
view(130, 10)
```

### Link 1

```
%figure
hold on
[V, F, N,name]=stlRead('link1.stl');
V = V*rotx(-pi/2);
REF = [REF; [0 0 0]];
FVsPlot(F,V,color(2,:))
axis equal
view(130, 10)
```

### Link 2

```
[V,F, N,name]=stlRead('link2.stl');
V = V*roty(pi/2)*rotx(-pi/2)*rotz(-pi/2)+[0.4318 0 0];
REF = [REF; [0 -0.1845 0]];
FVsPlot(F,V,color(3,:))
axis equal
view(130, 10)
```

### Link 3

```
[V,F, N,name]=stlRead('link3.stl');
V = V+[0.4, -0.14, 0];
REF = [REF; [0.4, -0.1845, 0]];
FVsPlot(F,V,color(4,:))
axis equal
view(130, 10)
```

### Link 4

```
[V,F, N,name]=stlRead('link4.stl');
V = V*rotx(-pi/2)+[0.4 -0.14 0.4318];
REF = [REF; [0.4 -0.14 0.4318]];
FVsPlot(F,V,color(5,:))
axis equal
view(130, 10)
```

### Link 5

```
[V,F, N,name]=stlRead('link5.stl');
V = V+[0.4 -0.14 0.4318];
REF = [REF; [0.4 -0.14 0.4318]];
```

```
FVsPlot(F,V,color(6,:))
axis equal
view(130, 10)
```

### Link 6

```
[V,F, N,name]=stlRead('link6.stl');
V = V+[0.4 -0.14 0.4318];
REF = [REF; [0.4 -0.14 0.4318+0.043]];
FVsPlot(F,V,color(7,:))
axis equal
view(130, 10)
```

## Plot function

```
function T_b_a=FVsPlot(F,V,color)
patch('Faces',F,'Vertices',V,'FaceColor',color, ...
         'FaceAlpha',0.8,...
         'EdgeColor',       'none',        ...
         'FaceLighting',    'gouraud',     ...
         'AmbientStrength', 0.15);

% Add a camera light, and tone down the specular highlighting
camlight('headlight');
material('dull');

grid on
xlabel 'X [mm]'
ylabel 'Y [mm]'
zlabel 'Z [mm]'
end
```

## Movement function

```
function T_algo=moveq1()


end
```