

2019



UNIVERSIDAD POLITÉCNICA  
DE LA ZONA METROPOLITANA DE GUADALAJARA.

# Tarea 3

Rotación con matrices

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Materia: Cinemática de robots.

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23/01/2019



```
% TAREA.3.ROTACIONES
```

```
% Rotacion 1
```

```
X = 60;
```

```
Y = 70;
```

```
Z = 10;
```

```
MX = [1 0 0;0 cos(X*pi/180) -sin(X*pi/180);0 sin(X*pi/180) cos(X*pi/180)];
```

```
MY = [cos(Y*pi/180) 0 sin(Y*pi/180);0 1 0; sin(Y*pi/180) 0 cos(Y*pi/180)];
```

```
MZ = [cos(Z*pi/180) -sin(Z*pi/180) 0; sin(Z*pi/180) cos(Z*pi/180) 0; 0 0 1];
```

```
Rot1 = MX*MY*MZ
```

```
% Rotacion 2
```

```
X = 40;
```

```
Y = 10;
```

```
X2 = 50;
```

```
MX = [1 0 0;0 cos(X*pi/180) -sin(X*pi/180);0 sin(X*pi/180) cos(X*pi/180)];
```

```
MY = [cos(Y*pi/180) 0 sin(Y*pi/180);0 1 0; sin(Y*pi/180) 0 cos(Y*pi/180)];
```

```
MX2 = [1 0 0;0 cos(X2*pi/180) -sin(X2*pi/180);0 sin(X2*pi/180) cos(X2*pi/180)];
```

```
Rot2 = MX*MY*MX2
```

```
% Rotacion 3
```

```
X = 20;
```

```
Z = 18;
```

```
X2 = 30;
```

```
MX = [1 0 0;0 cos(X*pi/180) -sin(X*pi/180);0 sin(X*pi/180) cos(X*pi/180)];
```

```
MZ = [cos(Z*pi/180) -sin(Z*pi/180) 0; sin(Z*pi/180) cos(Z*pi/180) 0; 0 0 1];
```

```
MX2 = [1 0 0;0 cos(X2*pi/180) -sin(X2*pi/180);0 sin(X2*pi/180) cos(X2*pi/180)];
```

```
Rot3 = MX*MZ*MX2
```

```
% Rotacion 4
```

```
X = 30;
```

```
Z = 10;
```

```
Y = 30;
```

```
MX = [1 0 0;0 cos(X*pi/180) -sin(X*pi/180);0 sin(X*pi/180) cos(X*pi/180)];
```

```

MZ = [cos(Z*pi/180) -sin(Z*pi/180) 0; sin(Z*pi/180) cos(Z*pi/180) 0; 0 0 1];

MY = [cos(Y*pi/180) 0 sin(Y*pi/180);0 1 0; sin(Y*pi/180) 0 cos(Y*pi/180)];

Rot4 = MX*MZ*MY

% Rotacion 5

Y = 30;
Z = 10;
X = 30;

MY = [cos(Y*pi/180) 0 sin(Y*pi/180);0 1 0; sin(Y*pi/180) 0 cos(Y*pi/180)];

MZ = [cos(Z*pi/180) -sin(Z*pi/180) 0; sin(Z*pi/180) cos(Z*pi/180) 0; 0 0 1];

MX = [1 0 0;0 cos(X*pi/180) -sin(X*pi/180);0 sin(X*pi/180) cos(X*pi/180)];

Rot5 = MY*MZ*MX

```

Rot1 =

0.3368	-0.0594	0.9397
-0.7146	0.6337	-0.2962
0.6131	0.7713	0.1710

Rot2 =

0.9848	0.1330	0.1116
-0.1116	0.0075	-0.9937
0.1330	0.9911	-0.0075

Rot3 =

0.9511	-0.2676	0.1545
0.2904	0.6030	-0.7430
0.1057	0.7515	0.6512

Rot4 =

0.8529	-0.1736	0.4924
-0.1198	0.8529	-0.3578
0.5082	0.4924	0.7934

Rot5 =

0.8529	0.1198	0.5082
0.1736	0.8529	-0.4924
0.4924	0.3578	0.7934

\*\*\*\*\*

Published with MATLAB® R2017b



## Evidencia de revisión

21 / Ene / 19

Jesús Carlos Gómez Medina

Matrices homogéneas

$$T = \begin{bmatrix} R_{3 \times 3} & P_{3 \times 1} \\ f_{1 \times 3} & w_{1 \times 1} \end{bmatrix} = \begin{bmatrix} [\text{Rotación}] & [\text{Punto } x y z] \\ [\text{Perspectiva ceros}] & [\text{escalado 1}] \end{bmatrix}$$

Tarea

Rotar

$x \rightarrow 60^\circ$     $y \rightarrow 70^\circ$     $z \rightarrow 10^\circ$

$x \rightarrow 40^\circ$     $y \rightarrow 10^\circ$     $x \rightarrow 50^\circ$