UNIVERSIDAD POLITÉCNICA DE LA ZONA METROPOLITANA DE GUADALAJARA

Actividad: Tarea 3
Materia: Cinemática de Robots
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Maestro: Carlos Enrique Moran Garabito

Tarea 3.

Matrices Homogéneas.

$$
\begin{bmatrix}
1 & 0 & 0 \\
0 & \cos 60 & -\sin 60 \\
0 & \sin 60 & \cos 60
\end{bmatrix}
\begin{bmatrix}
\cos 70 & 0 & \sin 70 \\
0 & 1 & 0 \\
-\sin 70 & 0 & \cos 70
\end{bmatrix}
\begin{bmatrix}
\cos 10 & \sin 10 & 0 \\
\sin 10 & \cos 10 & 0) \\
0 & 0 & 1
\end{bmatrix}
$$

$$
(XY)(Z)
\begin{bmatrix}
.342 & 0 & .94 \\
(.888 & .5 & -.200 \\
-.312 & .866 & .171
\end{bmatrix}
\quad
R=
\begin{bmatrix}
336 & -.6 & .94 \\
.888. & 351 & .296 \\
-.312. & 934 & .171
\end{bmatrix}
$$

$$
\begin{bmatrix}
1 & 0 & 0 \\
(0 & \cos 10 & -\sin 10) \\
0 & \sin 10 & \cos 10
\end{bmatrix}
\begin{bmatrix}
\cos 100 & & \sin 10 \\
(0 & 1 & 0) \\
-\sin 100 & & \cos 10
\end{bmatrix}
\begin{bmatrix}
\cos 50 & -\sin 50 & 0 \\
(\sin 50 & \cos 50 & 0) \\
0 & 0 & 1
\end{bmatrix}
$$

$$
(XY)(Z)
\begin{bmatrix}
-.839 & 0 & -.544 \\
(.405 & .660 & -.625) \\
-.362 & .745 & .558
\end{bmatrix}
\quad
\begin{bmatrix}
-839 & -1402 & -.524 \\
(.4052 & -.978 & -.777) \\
-.362 & .571 & .733
\end{bmatrix}
$$

3- X= 30   Z=10   y=30

X=30°

$$\begin{pmatrix} \cos 30 & 0 & \sin 30 \\ 0 & 1 & 0 \\ -\sin 30 & 0 & \cos 30 \end{pmatrix}$$

Z=10°

$$\begin{pmatrix} \cos 10 & -\sin 10 & 0 \\ \sin 10 & \cos 10 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

Y=30°

$$\begin{pmatrix} \cos 10 & -\sin 10 & 0 \\ \sin 10 & \cos 10 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

(XZX)(R)

$$\begin{pmatrix} .8528 & -.1503 & .5 \\ .1736 & .9848 & 0 \\ .4924 & .0868 & .860 \end{pmatrix}$$

4 –   X= 30   z=10   y=30

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos 30 & -\sin 30 \\ 0 & \sin 30 & \cos 30 \end{pmatrix}$$

$$\begin{pmatrix} \cos 10 & -\sin 10 & 0 \\ \sin 10 & \cos 10 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$$\begin{pmatrix} \cos 30 & 0 & \sin 30 \\ 0 & 1 & 0 \\ -\sin 30 & 0 & \cos 30 \end{pmatrix}$$

(XZX)(R)   R=

$$\begin{pmatrix} .9998 & 0 & 0 \\ .296 & .4546 & .8398 \\ .1709 & .8398 & .5150 \end{pmatrix}$$

5-   **X=42®**   **Z=18®**   **X=30®**

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos 10 & -\sin 10 \\ 0 & \sin 10 & \cos 10 \end{pmatrix} \quad \begin{pmatrix} \cos 50 & -\sin 50 & 0 \\ \sin 50 & \cos 50 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos 10 & -\sin 10 \\ 0 & \sin 10 & \cos 10 \end{pmatrix}$$

(XZ)(X)
$$\begin{pmatrix} .60 & .75 & 0 \\ -.306 & .169 & -20 \\ -.684 & .601 & .108 \end{pmatrix}$$

R=
$$\begin{pmatrix} .931 & -.309 & 0 \\ .290 & .694 & -.343 \\ .105 & .826 & 994 \end{pmatrix}$$