UNIVERSIDAD POLITÉCNICA
DE LA ZONA METROPOLITANA DE GUADALAJARA

CINEMATICA DE ROBOTS.

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Tarea 3.
Matrices Homogéneas.
UPZMG.
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Tarea 3.

Matrices Homogéneas.

1- X=60® Y=70® Z=10®

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos 60 & -\sin 60 \\ 0 & \sin 60 & \cos 60 \end{pmatrix} \quad \begin{pmatrix} \cos 70 & 0 & \sin 70 \\ 0 & 1 & 0 \\ -\sin 70 & 0 & \cos 70 \end{pmatrix} \quad \begin{pmatrix} \cos 10 & \sin 10 & 0 \\ \sin 10 & \cos 10 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

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

2- X=40® Y=10® Z=50®

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

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

1- X= 30 Z=10 y=30

$$\begin{pmatrix}1 & 0 & 0\\ 0 & \cos 30 & -\sin 30\\ 0 & \sin 30 & \cos 30\end{pmatrix} \quad \begin{pmatrix}\cos 10 & -\sin 10 & 0\\ \sin 10 & \cos 10 & 0\\ 0 & 0 & 1\end{pmatrix} \quad \begin{pmatrix}\cos 30 & 0 & \sin 30\\ 0 & 1 & 0\\ -\sin 30 & 0 & \cos 30\end{pmatrix}$$

(XZX)(R) R=

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

4 – X= 30 z=10 y=30

X=30® Z=10® Y=30®

$$\begin{pmatrix}\cos 30 & 0 & \sin 30\\ 0 & 1 & 0\\ -\sin 30 & 0 & \cos 30\end{pmatrix} \quad \begin{pmatrix}\cos 10 & -\sin 10 & 0\\ \sin 10 & \cos 10 & 0\\ 0 & 0 & 1\end{pmatrix} \quad \begin{pmatrix}\cos 10 & -\sin 10 & 0\\ \sin 10 & \cos 10 & 0\\ 0 & 0 & 1\end{pmatrix}$$

(XZX)(R)

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

5- X=42® Z=18® X=30®

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

$$(XZ)(X) = \begin{pmatrix} .60 & .75 & 0 \\ -.306 & .169 & -20 \\ -.684 & .601 & .108 \end{pmatrix} \qquad R = \begin{pmatrix} .931 & -.309 & 0 \\ .290 & .694 & -.343 \\ .105 & .826 & 994 \end{pmatrix}$$