MATRICES HOMOGENEAS

FLAVIO ANTONIO VAZQUEZ

UPZMG CINEMATICA DE ROBOTS

Matrices homogéneas:

1:

X=60®

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

Y=70®

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

Z=10®

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

(XY)(Z)

$$\begin{pmatrix} .342 & 0 & .94 \\ .888 & .5 & -.200 \\ -.312 & .866 & .171 \end{pmatrix}$$

R=

$$\begin{pmatrix} 336 & -.6 & .94 \\ .888 & .351 & .296 \\ -.312 & .934 & .171 \end{pmatrix}$$

2:

X=40®

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

Y=10®

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

Z=50®

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

(XY)(Z)

$$\begin{pmatrix} -.839 & 0 & -.544 \\ .405 & .660 & -.625 \\ -.362 & .745 & .558 \end{pmatrix}$$

$$\begin{pmatrix} -839 & -1402 & -.524 \\ .4052 & -.978 & -.777 \\ -.362 & .571 & .733 \end{pmatrix}$$

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) **R=**

$$\begin{pmatrix} .60 & .75 & 0 \\ -.306 & .169 & -20 \\ -.684 & .601 & .108 \end{pmatrix} \quad \begin{pmatrix} .931 & -.309 & 0 \\ .290 & .694 & -.343 \\ .105 & .826 & .994 \end{pmatrix}$$

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=**

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

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)

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