

MATRICES

TRANSFORMATIONS

- Transformations in 3D (rotation, scale, shear) can be expressed as 3x3 matrix multiplications
- Translations cannot
- *Homogeneous coordinates*
 - 3x3 \rightarrow 4x4
 - Translation by x,y,z \rightarrow

$$\begin{array}{cccc} 1 & 0 & 0 & x \\ 0 & 1 & 0 & y \\ 0 & 0 & 1 & z \\ 0 & 0 & 0 & 1 \end{array} \quad * \quad \begin{array}{c} a \\ b \\ c \\ 1 \end{array} = \begin{array}{cc} a + x & \\ b + y & \\ c + z & \\ 1 & \end{array} = w$$

- Division by w (*perspective division*) to retrieve inhomogeneous point
- The *Model matrix* defined the result of a number of transformations that are unique for an object