

$$\begin{bmatrix} \text{2D} \\ \text{point} \\ (3 \times 1) \end{bmatrix} = \begin{bmatrix} \text{Camera to} \\ \text{pixel coord.} \\ \text{trans. matrix} \\ (3 \times 3) \end{bmatrix} \begin{bmatrix} \text{Perspective} \\ \text{projection matrix} \\ (3 \times 4) \end{bmatrix} \begin{bmatrix} \text{World to} \\ \text{camera coord.} \\ \text{trans. matrix} \\ (4 \times 4) \end{bmatrix} \begin{bmatrix} \text{3D} \\ \text{point} \\ (4 \times 1) \end{bmatrix}$$