

Correction: W2V vs. V2W

slide 38 week3.day3 (Fri Jan 22)

- $M_{W2V} = TR$ $T = \begin{bmatrix} 1 & 0 & 0 & e_x \\ 0 & 1 & 0 & e_y \\ 0 & 0 & 1 & e_z \\ 0 & 0 & 0 & 1 \end{bmatrix}$ $R = \begin{bmatrix} u_x & v_x & w_x & 0 \\ u_y & v_y & w_y & 0 \\ u_z & v_z & w_z & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
- we derived position of camera in world
 - invert for world with respect to camera
- $M_{V2W} = (M_{W2V})^{-1} = R^{-1}T^{-1}$

$$M_{view2world} = \begin{bmatrix} u_x & u_y & u_z & 0 \\ v_x & v_y & v_z & 0 \\ w_x & w_y & w_z & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 & -e_x \\ 0 & 1 & 0 & -e_y \\ 0 & 0 & 1 & -e_z \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} u_x & u_y & u_z & -\mathbf{e} \cdot \mathbf{u} \\ v_x & v_y & v_z & -\mathbf{e} \cdot \mathbf{v} \\ w_x & w_y & w_z & -\mathbf{e} \cdot \mathbf{w} \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

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$$M_{V2W} = \begin{bmatrix} u_x & u_y & u_z & -e_x * u_x + -e_y * u_y + -e_z * u_z \\ v_x & v_y & v_z & -e_x * v_x + -e_y * v_y + -e_z * v_z \\ w_x & w_y & w_z & -e_x * w_x + -e_y * w_y + -e_z * w_z \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Correction: Perspective Derivation

slide 30 week4.day3 (Fri Jan 29)

z axis flip!

$$\begin{bmatrix} x' \\ y' \\ z' \\ w' \end{bmatrix} = \begin{bmatrix} E & 0 & A & 0 \\ 0 & F & B & 0 \\ 0 & 0 & C & D \\ 0 & 0 & -1 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ 1 \end{bmatrix}$$

$$x' = Ex + Az$$

$$y' = Fy + Bz$$

$$z' = Cz + D$$

$$w' = -z$$

$$x = \text{left} \rightarrow x'/w' = -1$$

$$x = \text{right} \rightarrow x'/w' = 1$$

$$y = \text{top} \rightarrow y'/w' = 1$$

$$y = \text{bottom} \rightarrow y'/w' = -1$$

$$z = -\text{near} \rightarrow z'/w' = 1$$

$$z = -\text{far} \rightarrow z'/w' = -1$$

$$y' = Fy + Bz, \quad \frac{y'}{w'} = \frac{Fy + Bz}{w'}, \quad 1 = \frac{Fy + Bz}{w'}, \quad 1 = \frac{Fy + Bz}{-z},$$

$$1 = F \frac{y}{-z} + B \frac{z}{-z}, \quad 1 = F \frac{y}{-z} - B, \quad 1 = F \frac{\text{top}}{-(-\text{near})} - B,$$

$$1 = F \frac{\text{top}}{\text{near}} - B$$

News

- P2 due date extended to Tue Mar 2 5pm
 - V2W correction affects Q1 and thus cascades to Q4-Q7
 - perspective correction affects Q8