

TP-5

slide 2: LookAt $((a_x, a_y, 0), (a_x, a_y, a_z), (0, 1, 0))$

$$N = A_1 - A_2 = (0, 0, -a_z) \xrightarrow{\text{Norm}} (0, 0, -1)$$

$$U = U_p \times N = \begin{vmatrix} \hat{x} & \hat{y} & \hat{z} \\ 0 & 0 & -1 \\ 0 & -1 & 0 \end{vmatrix} = (-1, 0, 0)$$

$$V = N \times U = \begin{vmatrix} \hat{x} & \hat{y} & \hat{z} \\ 0 & 0 & -1 \\ -1 & 0 & 0 \end{vmatrix} = (0, -1, 0)$$

$$-(A_1 \cdot U) = a_x; \quad -(A_1 \cdot V) = -a_y; \quad -(A_1 \cdot N) = 0$$

$$M = \begin{pmatrix} -1 & 0 & 0 & a_x \\ 0 & 1 & 0 & -a_y \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

slide 3: $M = \begin{pmatrix} 0 & 0 & 1 & -2 \\ 0 & -1 & 0 & 2 \\ 1 & 0 & 0 & -4 \\ 0 & 0 & 0 & 1 \end{pmatrix} \quad P = (0, 2, 2)$

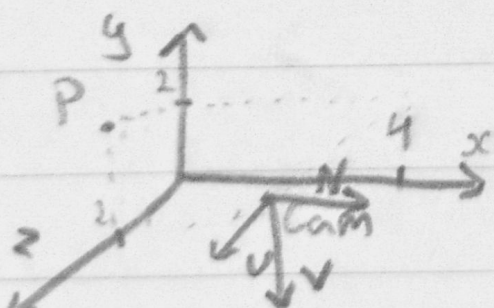
$$\text{norm}(Cam - P) = (1, 0, 0) \Leftrightarrow Cam - P = (c, 0, 0) \Leftrightarrow$$

$$\Leftrightarrow Cam = (c, 2, 2)$$

Sabemos que
 $-(Cam \cdot N) = -4$

$$-(Cam \cdot N) = -4 \Leftrightarrow c = 4, \text{ portanto: } Cam = (4, 2, 2)$$

$$U = (0, 0, 1); \quad V = (0, -1, 0); \quad N = (1, 0, 0)$$



slide 9:

$M = M_2 M_1^{-1}$ pois, quando aplicado a um ponto P no referencial

de Obs 1, ou seja: $M_1 P$, obtém-se:

$$M M_1 P = M_2 M_1^{-1} M P = M_2 I P = M_2 P$$