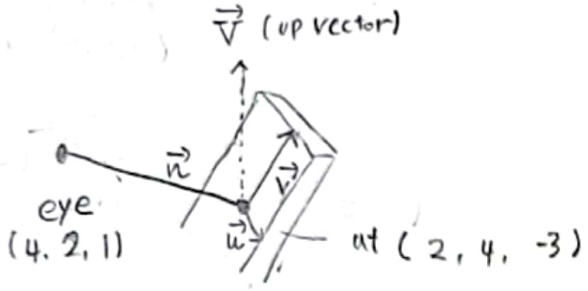
eye (4.0, 2.0, 1.0) at (2.0, 4.0, -3.0) up (0, 1.0, 0)



$\vec{N}$ = eye - at = (4, 2, 1) − (2, 4, -3) = [2, -2, 4] 이다.

$\vec{n} = \frac{\vec{N}}{|\vec{N}|}$ 이고 $|\vec{N}|$ 은 $\sqrt{4+4+16} = \sqrt{24} = 2\sqrt{6}$ 이다

$\vec{n} = \left[\frac{2}{2\sqrt{6}}, \frac{-2}{2\sqrt{6}}, \frac{4}{2\sqrt{6}}\right] = \left[\frac{1}{\sqrt{6}}, -\frac{1}{\sqrt{6}}, \frac{2}{\sqrt{6}}\right]$

$\vec{V} = [0, 1, 0]$ 이고 $\vec{u} = \frac{\vec{V} \times \vec{n}}{|\vec{V}|}$ 이다

$\vec{V} \times \vec{n}$ 은 $\left[-\frac{2}{\sqrt{6}}, 0, -\frac{1}{\sqrt{6}}\right]$ 이다.

즉 $\vec{u} = \left[\frac{\frac{2}{\sqrt{6}}}{\sqrt{\frac{5}{6}}}, 0, \frac{-\frac{1}{\sqrt{6}}}{\sqrt{\frac{5}{6}}}\right] = \left[\frac{2}{\sqrt{5}}, 0, -\frac{1}{\sqrt{5}}\right]$

$\vec{v} = \vec{n} \times \vec{u} = \left[\frac{1}{\sqrt{30}}, \frac{5}{\sqrt{30}}, \frac{2}{\sqrt{30}}\right]$

$$T_{w,c} = (T_{c,w})^{-1} = \begin{bmatrix} u_x & v_x & n_x & x_0 \\ u_y & v_y & n_y & y_0 \\ u_z & v_z & n_z & z_0 \\ 0 & 0 & 0 & 1 \end{bmatrix}^{-1} = \begin{bmatrix} \frac{2}{\sqrt{5}} & \frac{1}{\sqrt{30}} & \frac{1}{\sqrt{6}} & 4 \\ 0 & \frac{5}{\sqrt{30}} & -\frac{1}{\sqrt{6}} & 2 \\ -\frac{1}{\sqrt{5}} & \frac{2}{\sqrt{30}} & \frac{2}{\sqrt{6}} & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}^{-1}$$

$$T_{u,c} = \begin{bmatrix} \frac{2}{\sqrt{5}} & 0 & -\frac{1}{\sqrt{5}} & -\frac{7}{\sqrt{5}} \\ \frac{1}{\sqrt{30}} & \frac{5}{\sqrt{30}} & \frac{2}{\sqrt{36}} & -\frac{16}{\sqrt{30}} \\ \frac{1}{\sqrt{6}} & -\frac{1}{\sqrt{6}} & \frac{2}{\sqrt{6}} & -\frac{4}{\sqrt{6}} \\ 0 & 0 & 0 & 1 \end{bmatrix}$$