

Jorge Rodriguez-Arraiz

Dr. Bui

Computer Graphics

11/6/23

Checkpoints 1-4:

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11/7/23

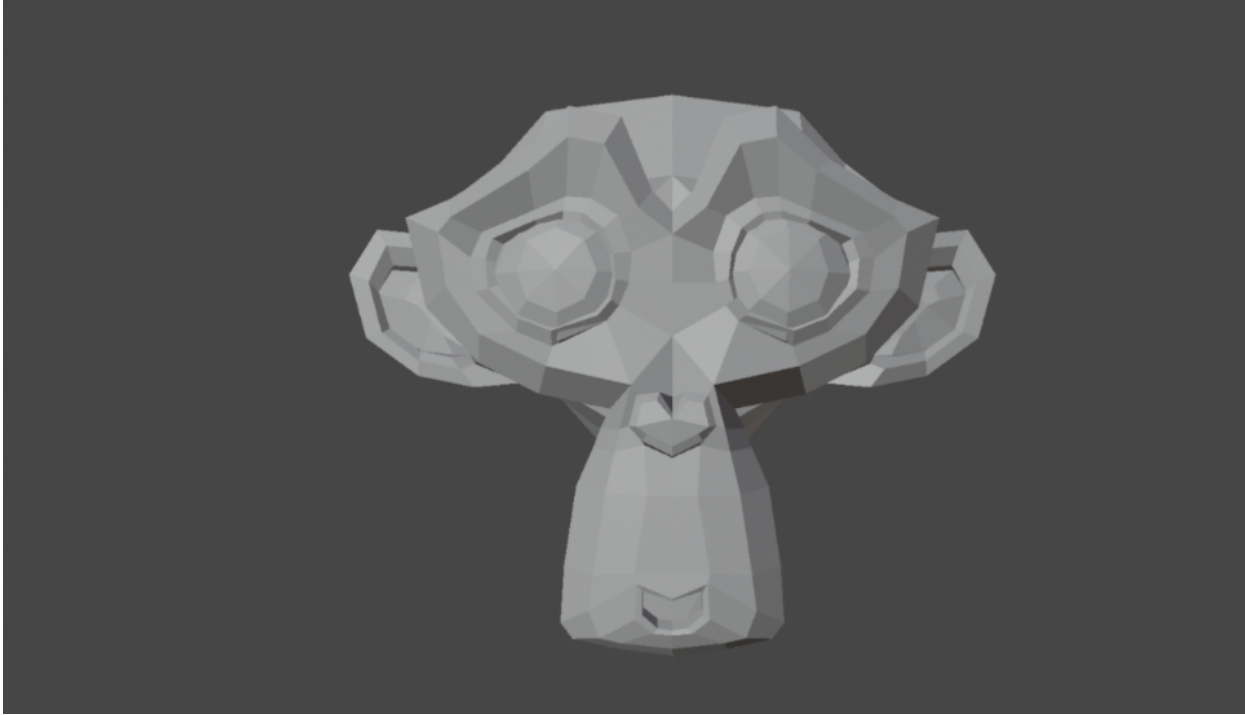
1. $P_{xy} \Rightarrow R_x = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \theta/4 & -\sin \theta/4 \\ 0 & \sin \theta/4 & \cos \theta/4 \end{bmatrix}$
 $R_x = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \theta/4 & -\sin \theta/4 \\ 0 & \sin \theta/4 & \cos \theta/4 \end{bmatrix} \begin{bmatrix} \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \end{bmatrix} = \begin{bmatrix} \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \end{bmatrix}$
 $R_y = \begin{bmatrix} \cos \frac{\pi}{4} & 0 & \sin \frac{\pi}{4} \\ 0 & 1 & 0 \\ -\sin \frac{\pi}{4} & 0 & \cos \frac{\pi}{4} \end{bmatrix} \begin{bmatrix} \frac{1}{2} \\ 0 \\ \frac{1}{2} \end{bmatrix} = \begin{bmatrix} \frac{1+\sqrt{2}}{2} \\ 0 \\ \frac{1-\sqrt{2}}{2} \end{bmatrix}$

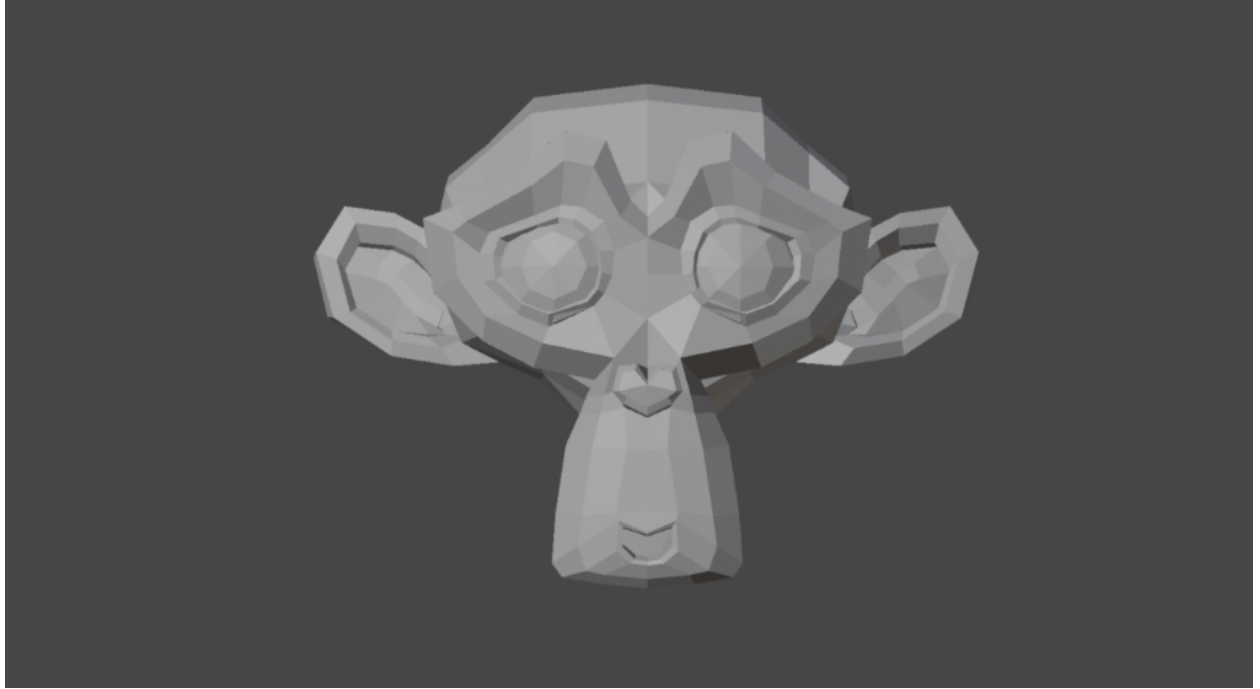
2. $P_y \Rightarrow \begin{bmatrix} \cos(\frac{\pi}{4}) & 0 & \sin(\frac{\pi}{4}) \\ 0 & 1 & 0 \\ \sin(\frac{\pi}{4}) & 0 & \cos(\frac{\pi}{4}) \end{bmatrix} \begin{bmatrix} \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \end{bmatrix} = \begin{bmatrix} \frac{\sqrt{2}}{2} \\ \frac{1}{2} \\ \frac{1}{2} \end{bmatrix}$
 $\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos(\frac{\pi}{4}) & -\sin(\frac{\pi}{4}) \\ 0 & \sin(\frac{\pi}{4}) & \cos(\frac{\pi}{4}) \end{bmatrix} \begin{bmatrix} \frac{\sqrt{2}}{2} \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} \frac{\sqrt{2}}{2} \\ \frac{1}{2} \\ -\frac{1}{2} \end{bmatrix} = \begin{bmatrix} \frac{\sqrt{2}}{2} \\ \frac{1}{2} \\ -\frac{1}{2} \end{bmatrix}$

3. $\begin{pmatrix} -\frac{2}{2} \\ -\frac{1}{2} \\ \frac{1}{2} \end{pmatrix} + \begin{pmatrix} \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \end{pmatrix} = \begin{pmatrix} -\frac{1}{2} \\ 0 \\ 1 \end{pmatrix}$

4. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{2} & \frac{1}{2} \\ 0 & \frac{1}{2} & \frac{\sqrt{2}}{2} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \frac{\sqrt{2}}{2} & \frac{1}{2} \\ 0 & \frac{1}{2} & \frac{\sqrt{2}}{2} \end{bmatrix}$

Checkpoint 5:





Checkpoint 6:
They are the same because of the focus on the camera.

Checkpoint 7:

