

CS130 Winter 2013 Homework 8

Name:

Student ID:

Written Response

1. Take the unit quaternions $q_1 = \{0, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}\}$ and $q_2 = \{\frac{1}{2}, \frac{1}{2}, \frac{1}{2}, \frac{1}{2}\}$. Compose the two quaternions q_1 and q_2 to create a third quaternion q_3 . Show the algebraic formula as well as the mathematical result. What is the effect of applying q_3 to a vector?
2. Given the normalized vertical and horizontal vectors V and H of the image pixel plane, as well as its central focal point F , find the position of the center of pixel $(2,3)$ from the bottom left corner. Assume that one pixel is width 1, and the image pixel plane is 10×10 pixels.