



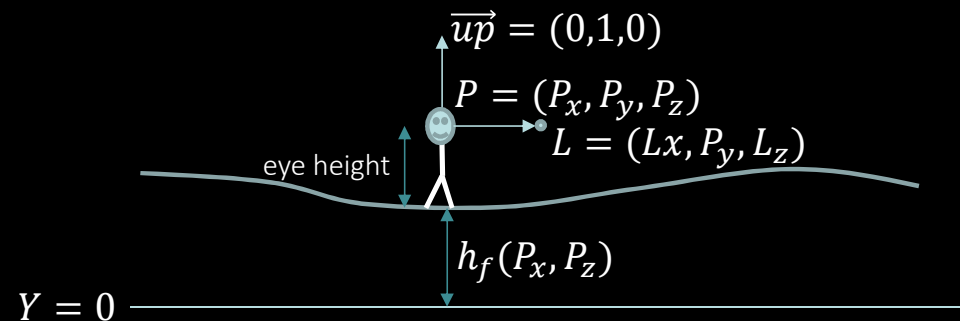
Camera Control

First person camera on a terrain



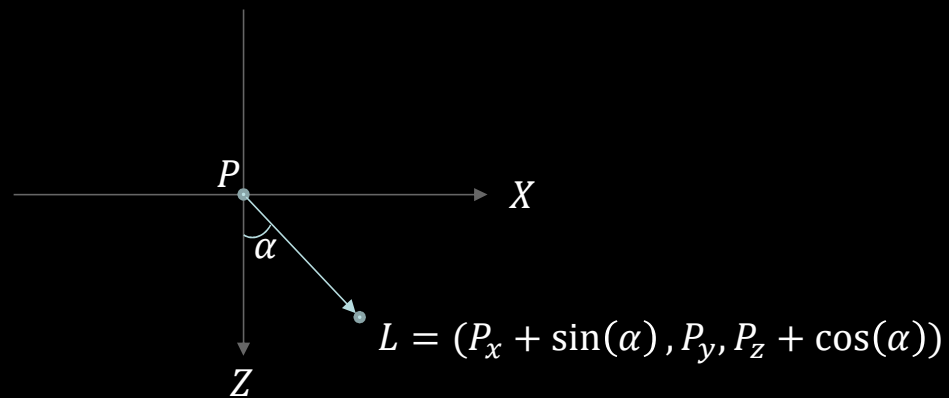
Camera Placement

- Consider `gluLookAt` parameters:
 - P : camera position; L : “look at” point; \vec{up} : up vector
- The P_y value of the camera position is taken directly from the terrain height + the height of the “user” eyes.
 - Use function `hf(x, z)` $P_y = \text{eye height} + hf(P_x, P_z)$
- Assume that the user is always looking in an horizontal direction. $L_y = P_y$





Camera Orientation





Forward/Backward Motion



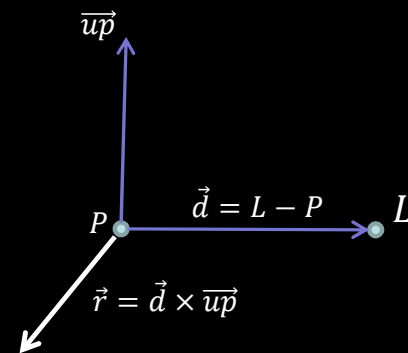
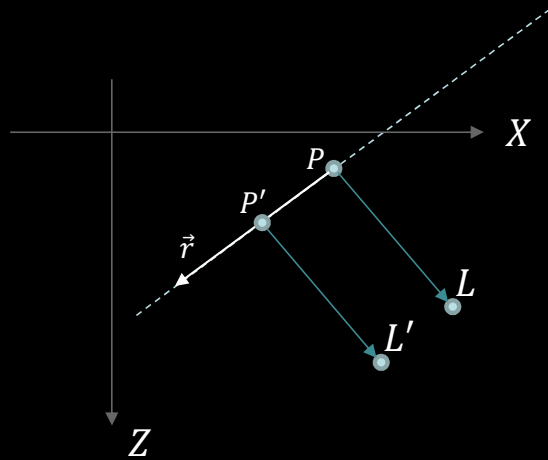
$$\vec{d} = L - P = (L_x - P_x, 0, L_z - P_z)$$

$$P' = P + k\vec{d}$$

$$L' = L + k\vec{d}$$



Camera Lateral Motion



$$\begin{aligned}P' &= P + k\vec{r} \\L' &= L + k\vec{r}\end{aligned}$$



Assignment

- Add first person camera to the project.
 - Camera must follow the terrain (slide 2)
 - Allow camera to look around (slide 3)
 - Move forward and backward (slide 4)
 - Move sideways (slide 5)