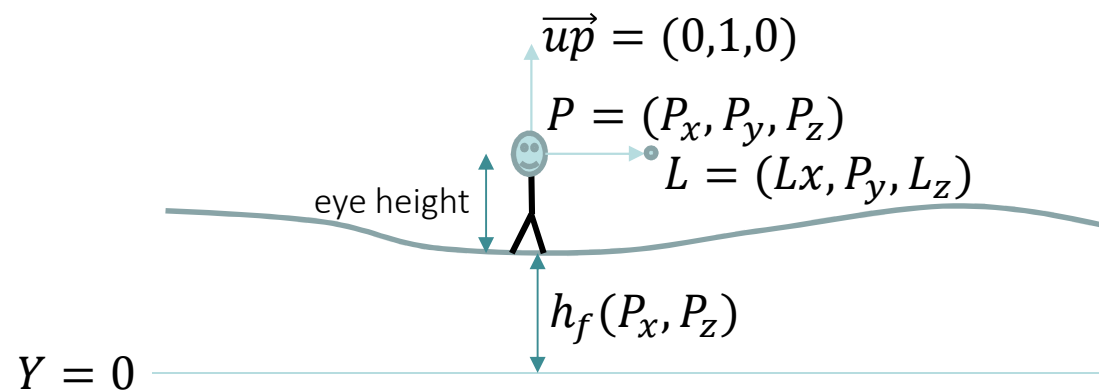# Camera Control

First person camera on a terrain
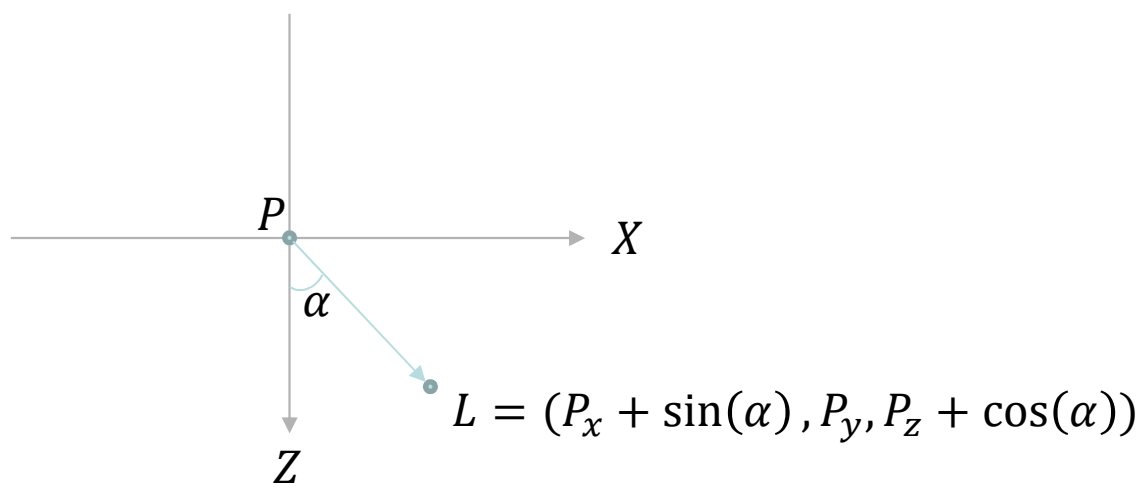
Camera Placement

- Consider `gluLookAt` parameters:
  - P: camera position; L: "look at" point; $\overrightarrow{up}$: 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)` $P_y = eye\ height + hf(P_x, P_z)$

- Assume that the user is always looking in an horizontal direction. $L_y = P_y$

$$\overrightarrow{up} = (0,1,0)$$
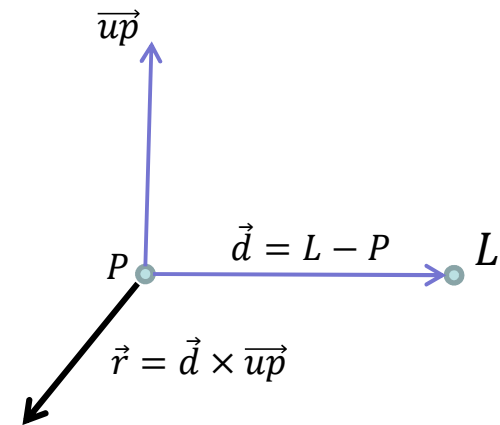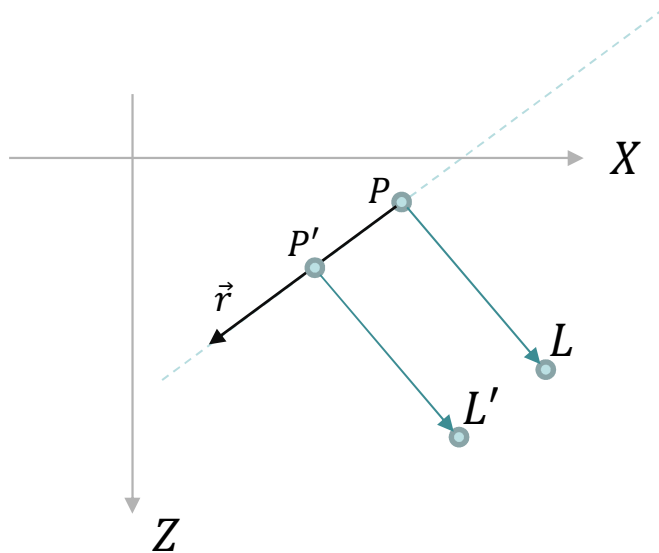
$$P = (P_x, P_y, P_z)$$

$$L = (Lx, P_y, L_z)$$

eye height

$$h_f(P_x, P_z)$$

$Y = 0$

Camera Orientation

P

X

α

$L = (P_x + \sin(\alpha), P_y, P_z + \cos(\alpha))$

Z

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Forward/Backward Motion

P P' L L'

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

Camera Lateral Motion

$$P' = P + k\vec{r}$$
$$L' = L + k\vec{r}$$

Assignment

- Complete last week's lesson;

- Add first person camera to the project.