

Lab 02. Image filtering and transform

Introduction to Computer vision, lab 02.

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Gaussian filtering



Median filtering



Bilateral filtering



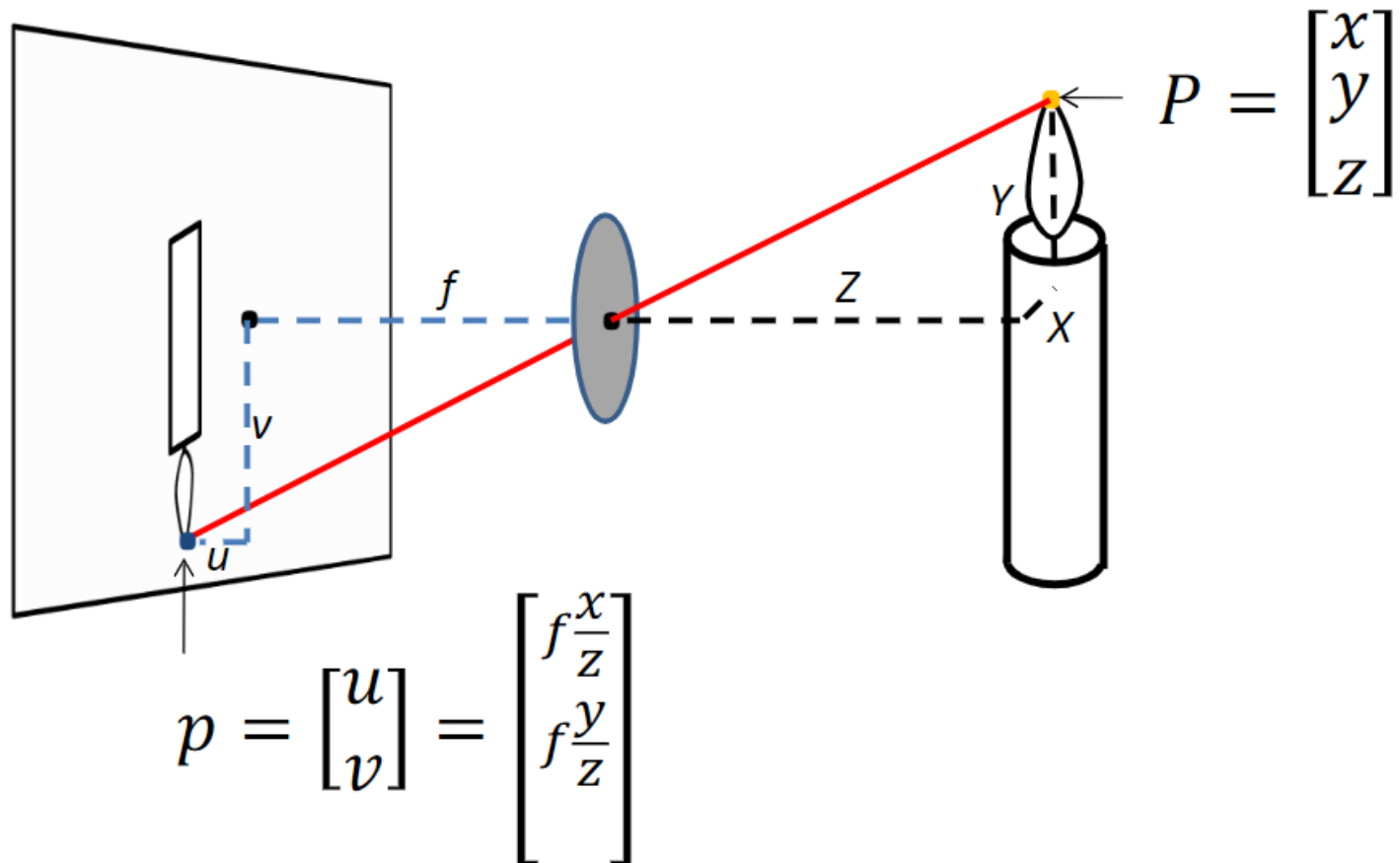
Image filtering

- 边缘处理 aaa|abcde|eee
- 其他参数与opencv-python要求一致

https://docs.opencv.org/4.5.3/d4/d86/group_imgproc__filter.html

Perspective projection

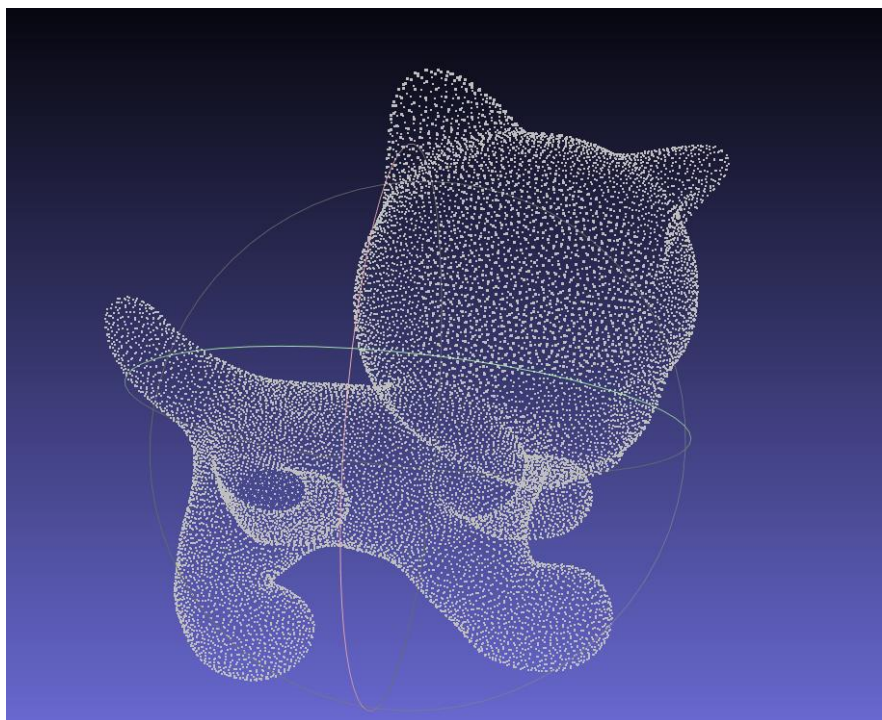
- 3D world coordinates \rightarrow 2D image coordinates



Perspective projection

输入: 点云模型, 焦距 (f_x, f_y)

输出: UV坐标, 使用matplotlib.pyplot以散点图的形式绘制在2D平面上。



使用矩阵运算完成作业

- Projection is a matrix multiplication using homogeneous coordinates

$$\begin{bmatrix} f & 0 & 0 & 0 \\ 0 & f & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \\ 1 \end{bmatrix} = \begin{bmatrix} fx \\ fy \\ z \end{bmatrix} \cong \begin{bmatrix} f\frac{x}{z} \\ f\frac{y}{z} \\ 1 \end{bmatrix}$$