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LABORATORY #4

Summary

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- Perspective transformations
- We want to find image coordinates of world points

Homework #1

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- Given
  - A point cloud ⟶ collections of world points with world coordinates
    - Scan.dat
  - Camera(s) parameters ⟶ intrinsic and extrinsic parameters
    - params_*.dat
- Generate resulting image(s)

OpenCV VIZ

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- Can be used for data visualization
- Difficult to install
- If not available
  - Comment out the #define USE_OPENCVVIZ in utils.h
  - Use gnuplot to visualize data:
    - gnuplot
      - splot “scan_gnuplot.dat”

Notes

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- Each line of scan.dat corresponds to a 3D world point as
  - -0.0434742 -4.82982 0.499645
  - 0.0295245 -4.82834 0.541775
  - 0.103245 -4.84538 0.584323
  - 0.176457 -4.84095 0.626577
  - …

Notes

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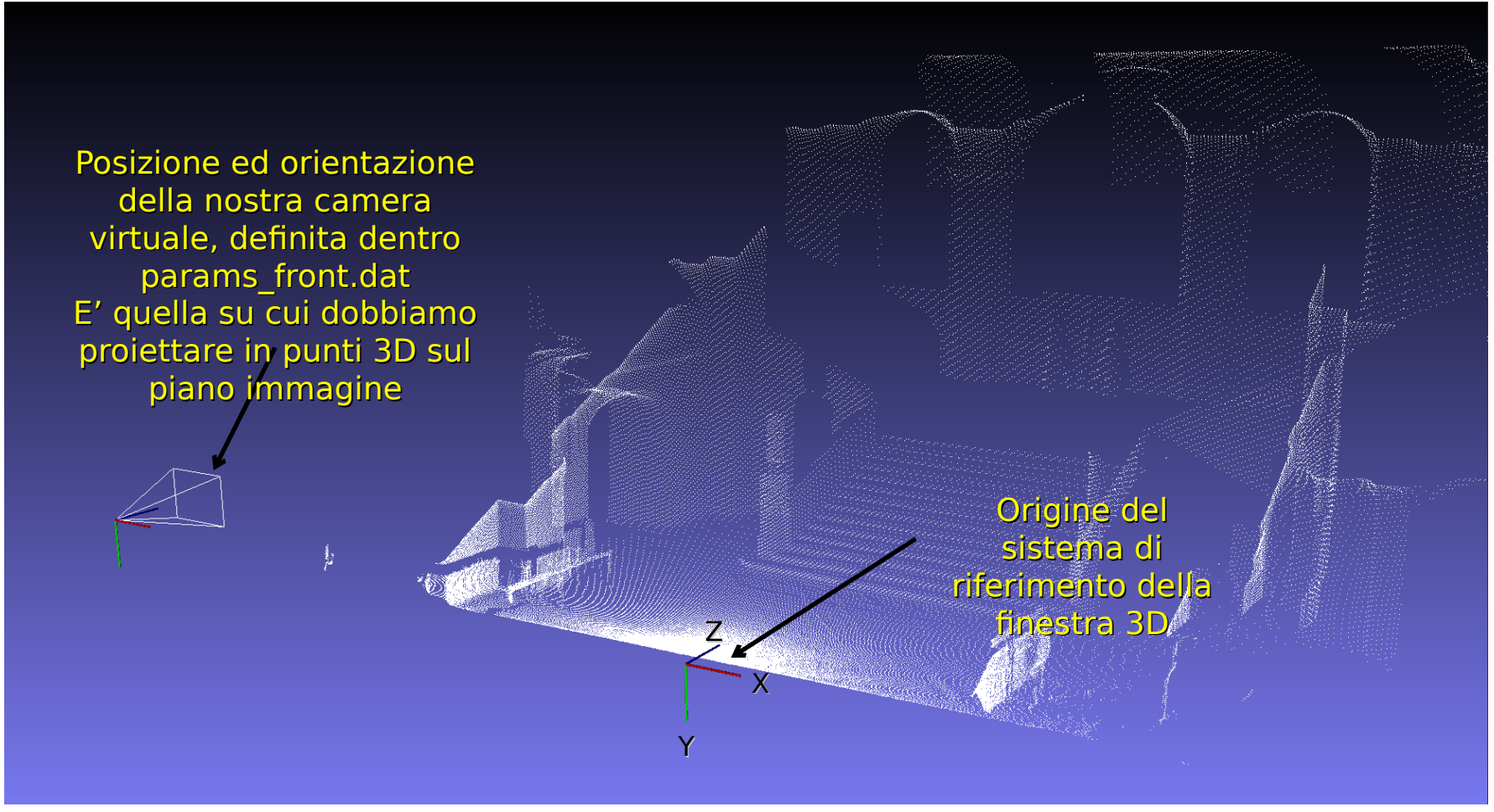
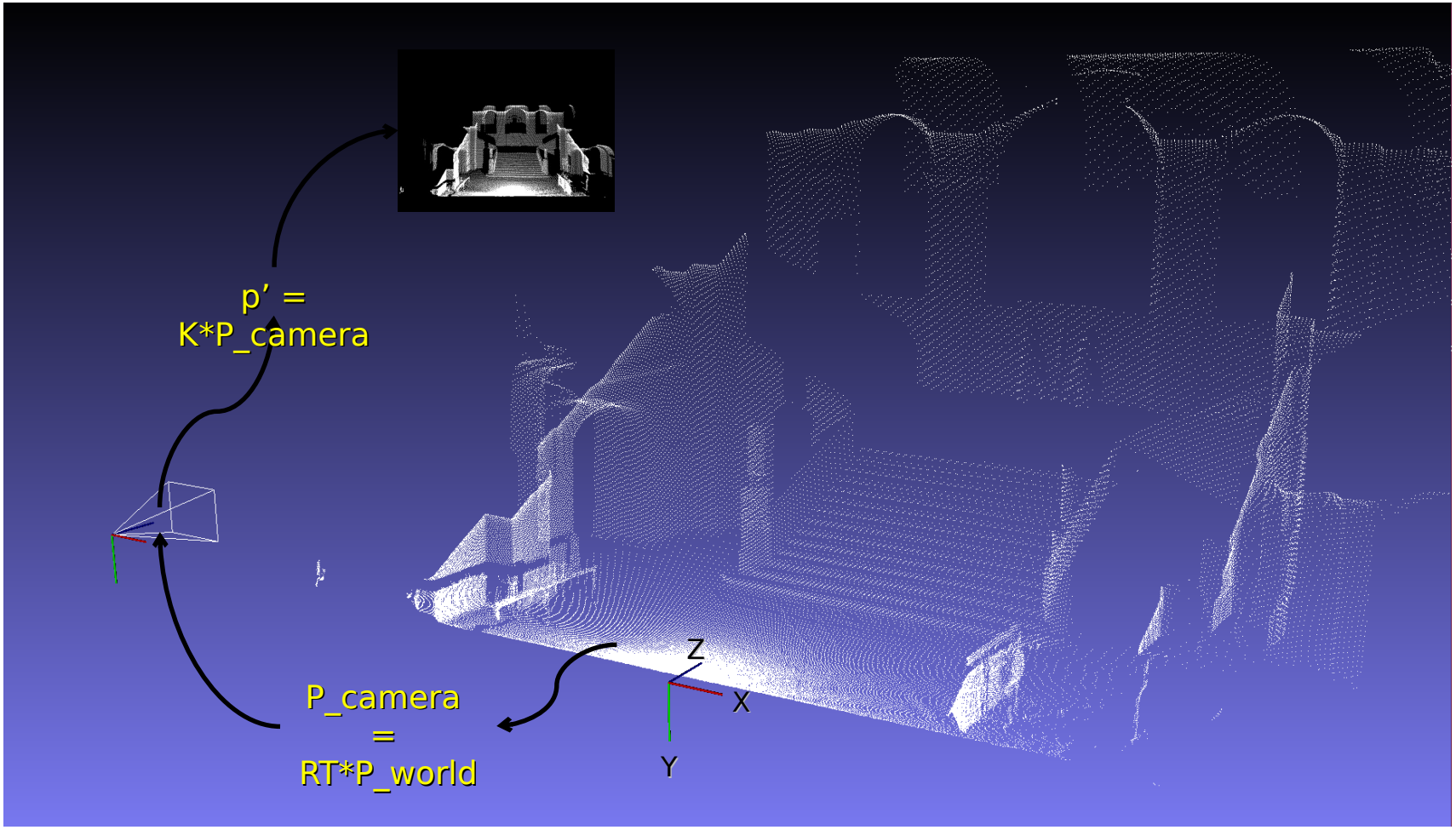
- Params_*.dat files contains camera data as follows:
  - 640 480 //width and height
  - 400 400 //f (pixels)
  - 320 240 //optical center u0, vo
  - 0.0 0.0 0.0 //orientation wrt x,y,z
  - 0.0 -5.0 -10.0 //position wrt x,y,z

Notes


Posizione ed orientazione della nostra camera virtuale, definita dentro params_front.dat
E' quella su cui dobbiamo proiettare in punti 3D sul piano immagine
Origine del sistema di riferimento della finestra 3D
Z
X
Y

Notes



Homework #2

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- Rotate camera around the center of gravity of the cloud point
  - Also rotate camera around Y axis to always frame the data
- Generate resulting images