

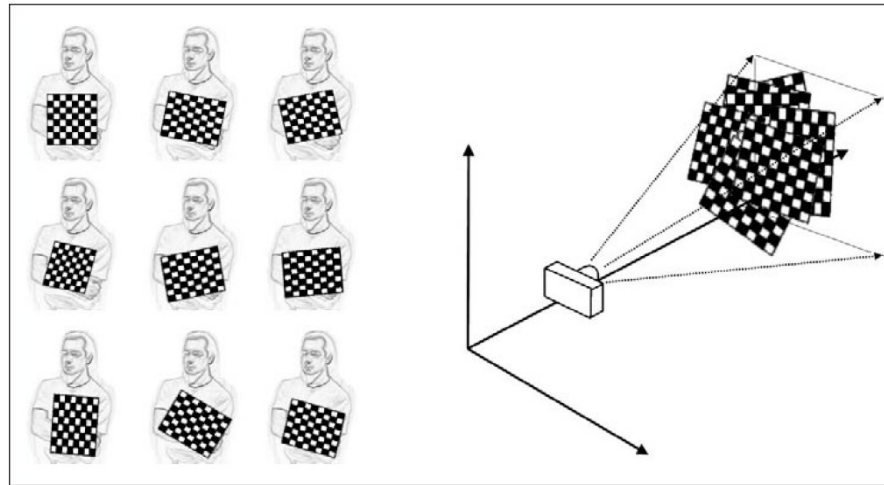
# Homework 1

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# Assignment

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- In this assignment, you will practice how to implement camera calibration.
- For implement details, please refer to the slides [02-camera p.76-80](#).
- We will provide an example code, you need to revise it by your calibration function.
- **DO NOT** use the `cv2.calibrateCamera` or other calibration functions, you need to implement it from scratch.



# Assignment

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- In example code ([camera\\_calibration.py](#)), the code of loading data is provided.
  - ✓ command: `python camera_calibration.py`
- Camera calibration:
  - ✓ First, figure out the  $H_i$  of each images.
  - ✓ Use  $H_i$  to find  $B$ , and calculate intrinsic matrix  $K$  from  $B$  by using Cholesky factorization.
  - ✓ Then, get extrinsic matrix  $[R|t]$  for each images by  $K$  and  $H$  (p.79).
- After you find out the intrinsic matrix and extrinsic matrixes, plot it like p.86 result.
  - ✓ plot code is given, you only need to feed the data in.
- For mathematic details, please refer to slides [02-camera p.76-80](#).

# Assignment

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- Two types of data you should try:
  - ✓ images we provided in data folder
  - ✓ images captured by your smart phone
    - We have provided the chessboard image, print it out and take photo with it.
    - **NOTICE** that you should close the AF(auto focus) function of your camera, and set a fix focus.
    - If you don't know how to fix focus of your camera, please google it or ask TAs.

# Assignment

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- Deadline: 2020/3/30 23:55:00 pm
- Hand in your report and code on New E3.
- The report should include:
  - ✓ your introduction
  - ✓ implementation procedure
  - ✓ experimental result (of course you should also try your own images)
  - ✓ discussion
  - ✓ conclusion
  - ✓ work assignment plan between team members.
- If you have any problems, please e-mail to TAs.