

**Assignment 4:**

# **Stereo Matching**

Computer Vision  
National Taiwan University

Fall 2018

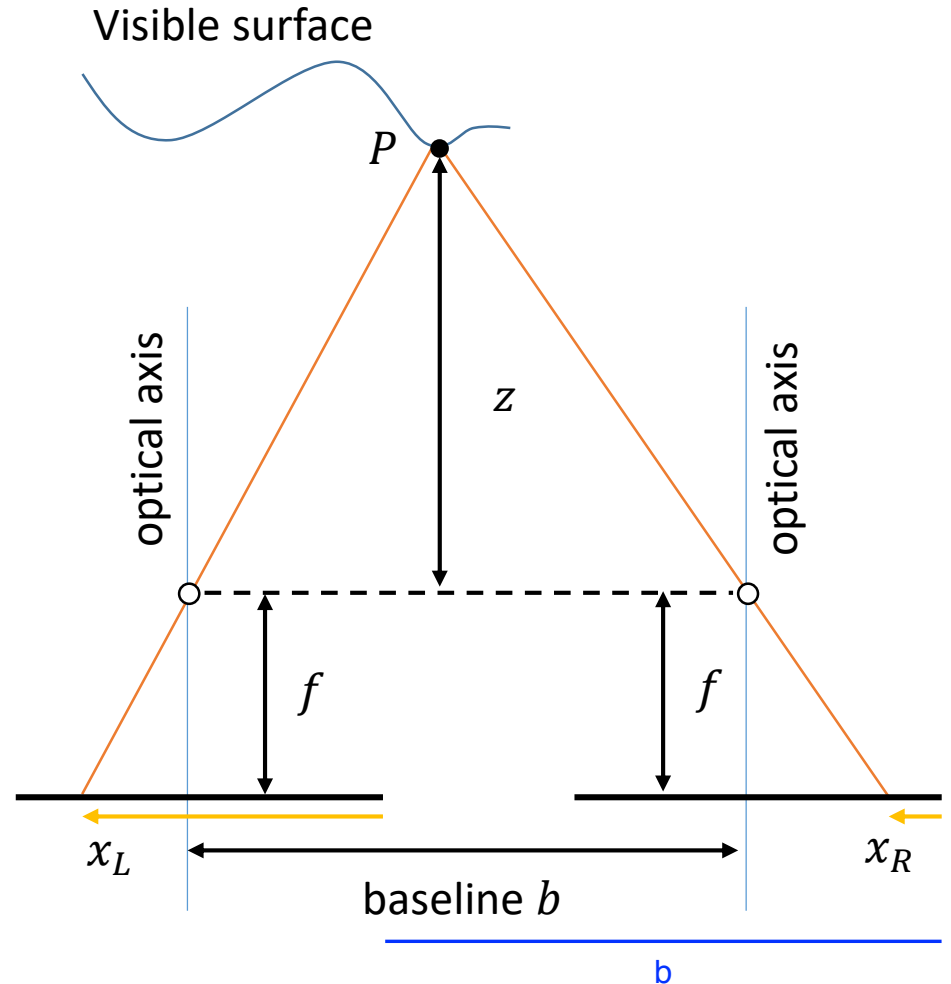
# Part 1: Depth from Disparity

- Let  $d = x_L - x_R$

- Prove

$$d = \frac{f \cdot b}{z}$$

(hint: similar triangles)



# Part 2: Disparity Estimation

- Compute disparity maps for the four standard test pairs from [Middlebury v2](#)
- Evaluation metric: bad pixel ratio (error threshold = 1)

*Tsukuba*



Max disp = 15  
Scale factor = 16

*Venus*



Max disp = 20  
Scale factor = 8

*Teddy*



Max disp = 60  
Scale factor = 4

*Cones*



Max disp = 60  
Scale factor = 4

# Part 2: Regulations

- Implement your code in [main.py](#)
- Evaluate using [eval\\_stereo.py](#)
- Do not use deep matching costs

# Grading

- Part 1: 10%
- Part2:
  - Tsukuba baseline = 8.0 (15%)
  - Venus baseline = 5.0 (15%)
  - Teddy baseline = 18.0 (15%)
  - Cones baseline = 15.0 (15%)
  - Ranking according to the avg. score among the class (20%)
  - Report (10%)

# Report

- Your student ID and name
- Part 1
  - Write down your proof.
- Part 2
  - Explain your algorithm in terms of the standard 4-step pipeline.  
(cost computation, cost aggregation, disp. optimization, disp. refinement)
  - Show your output disparity maps in the report.
  - Show your bad pixel ratio in the report.
  - Your reference papers or websites.

# Submission

- Code: main.py (Python 3.5+)
- A PDF report
- Compress all above files in a zip file named StudentID.zip
  - e.g. R07654321.zip
- Submit to CEIBA
- Deadline: 12/28 11:00 pm