Assignment 4: Stereo Matching

Computer Vision

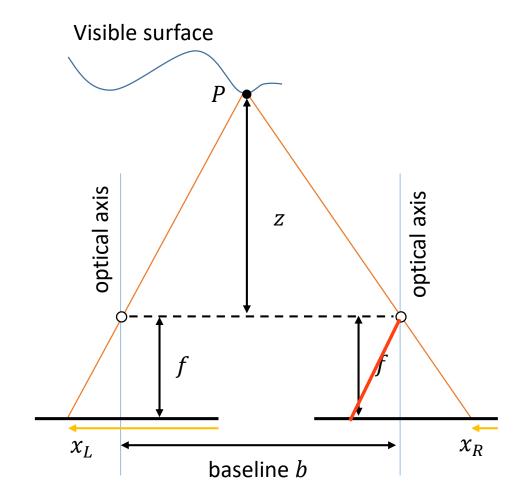
National Taiwan University

Fall 2018

Part 1: Depth from Disparity

- Let $d = x_L x_R$
- Prove $d = \frac{f \cdot b}{7}$

(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