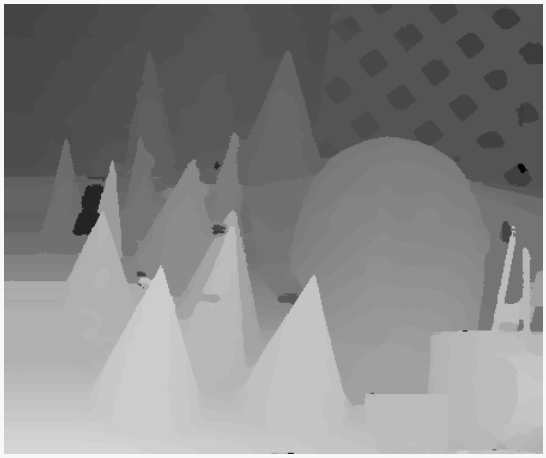
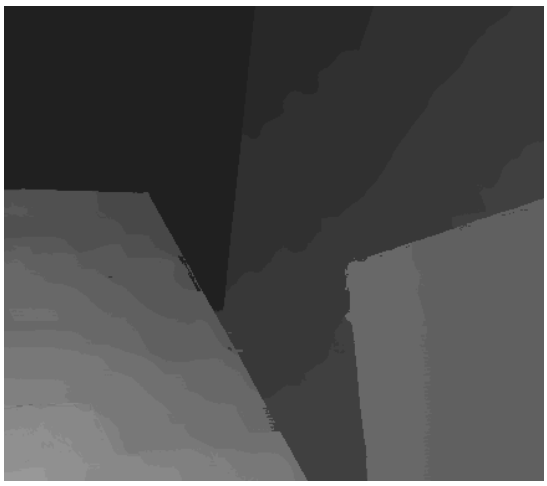
EE5053 Hw4

b06902034 黃柏諭

Disparity Map



Bad Pixel Ratio

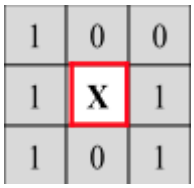
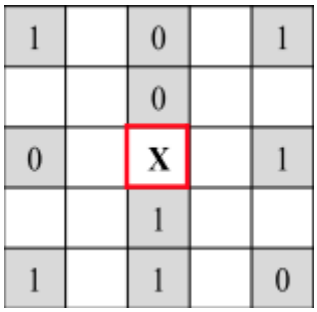
Tsukuba: 2.73%

Teddy: 9.32%

Algorithm

Cost Computation

Use census cost with different size of windows.

Small Window	Large Window
	

Reference: Huang, CS., Huang, YH., Chan, DY. *et al.* Shape-reserved stereo matching with segment-based cost aggregation and dual-path refinement. *J Image Video Proc.* **2020,** 38 (2020). https://doi.org/10.1186/s13640-020-00525-3

Use Large Window on Tsukuba as it performs better.

Cost Aggregation

Simply apply Joint Bilateral Filter on each disparity cost using the original RGB image as guide.

Disparity Optimization

Simply apply Winner-take-all.

Disparity Refinement

- Left-right consistency check

  If $D_L(x, y) \neq D_R(x - D_L(x, y), y)$ mark it as hole

- Hole filling
  - F_L , the disparity map filled by closest valid disparity from left
  - F_R, the disparity map filled by closest valid disparity from right
  - Final filled disparity map $D = \min(F_L, F_R)$ (pixel-wise minimum)

Reference: Homework 4 slides http://media.ee.ntu.edu.tw/courses/cv/21S/hw/hw4/hw4.pdf

Hyper Parameter

- Grid search on Teddy and Tsukuba
- Try and observe by eye on Cones and Venus