Computer Vision HW4 Report

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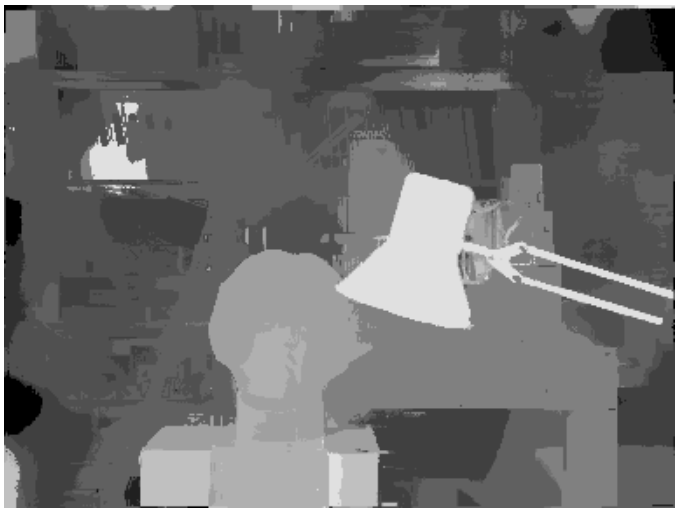
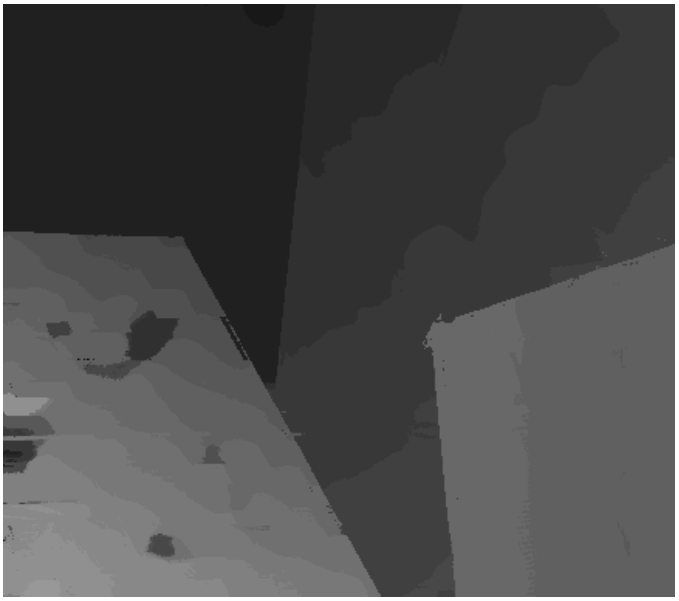
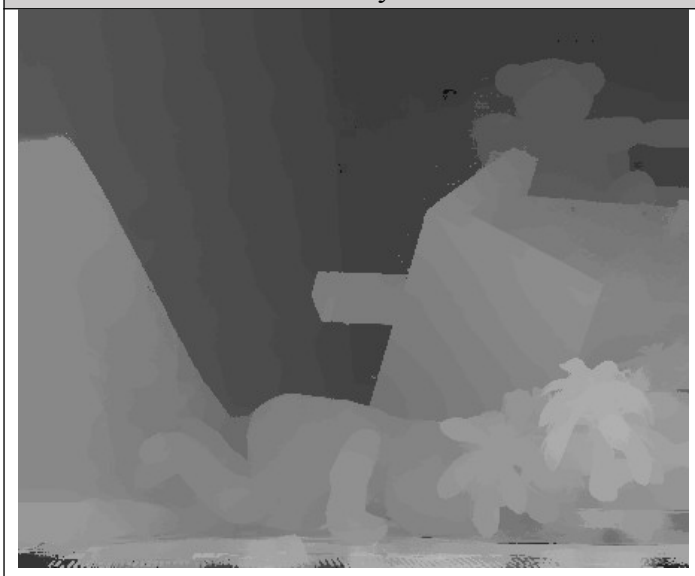
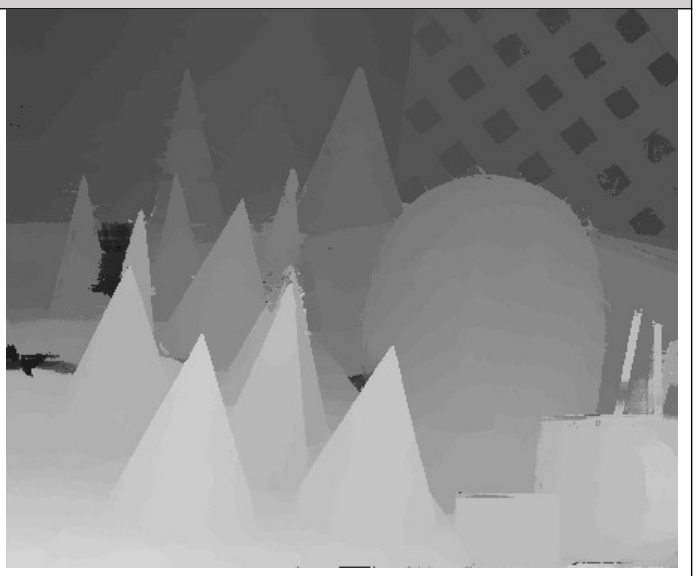
Visualize the disparity map of 4 testing images.

Tsukuba	Venus
	
Teddy	**Cones**
	

Report the bad pixel ratio of 2 testing images with given ground truth (Tsukuba/Teddy).

	bad pixel ratio
Tsukuba	4.60%
Teddy	9.29%

Describe your algorithm in terms of 4-step pipeline.

1. Cost Computation
   - Perform zero padding on images.
   - Create binary matrices for storing local binary pattern.
   - Move the mask over 3x3 pixel block for compute census cost.
   - Crop the padded binary matrices to original image size.
2. Cost Aggregation
   - Smooth the cost by joint bilateral filter (choose suitable σ_s, σ_r).
3. Disparity Optimization
   - Get the winner from left-to-right and right-to-left costs by finding the minimum value index.
4. Disparity Refinement
   - Consistency check: Create a mask of positive coordinates and another mask is the result of D_L=D_R.
   - Hole filling: Mark the holes based on previous valid coordinate mask. Filled the disparity maps F_L, F_R.
   - Find the pixel-wise minimum from F_L, F_R.
   - Get the final result by weighted median filtering.