Stereo Matching using Graphcut Optimization

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Stereo Matching

- 2 input images

- Disparity image

Graphcut Optimization

- Labelling Pixels

- Energy function

- Gradient Descent using Alpha-Beta swap and Alpha-expansion

$$E(f) = \sum_{\{p,q\} \in \mathcal{N}} V_{p,q}(f_p, f_q) + \sum_{p \in \mathcal{P}} D_p(f_p)$$

Setup

- Data term

$$D_{i,j}(f) = min\{|I(i,j) - I'(i,j-f)|, 200\}$$
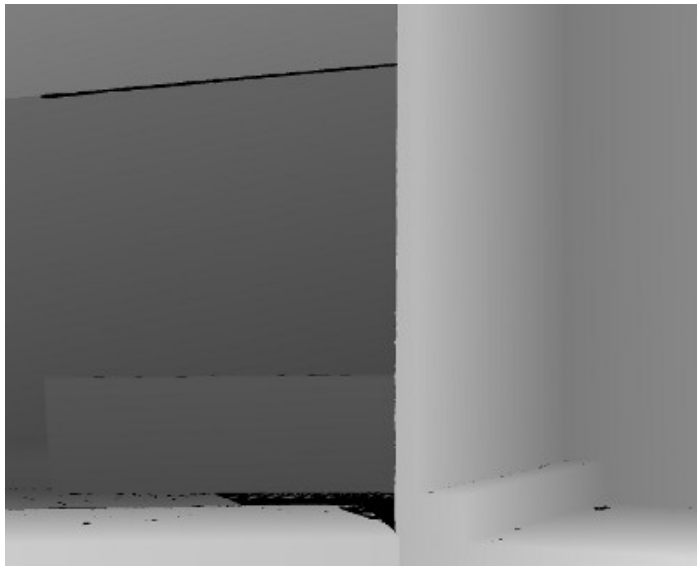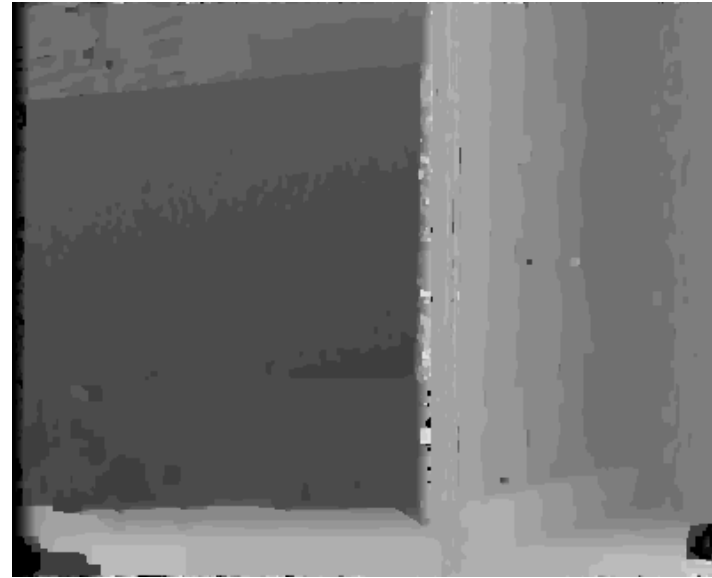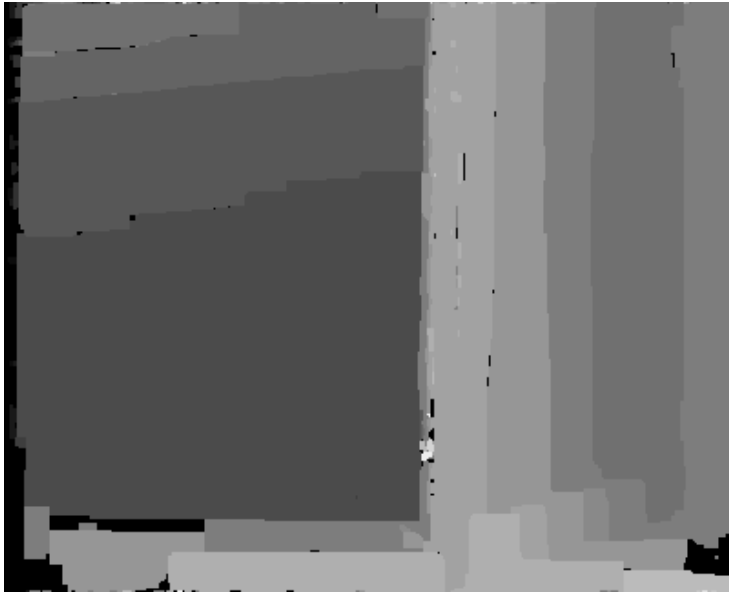
- Smoothness:
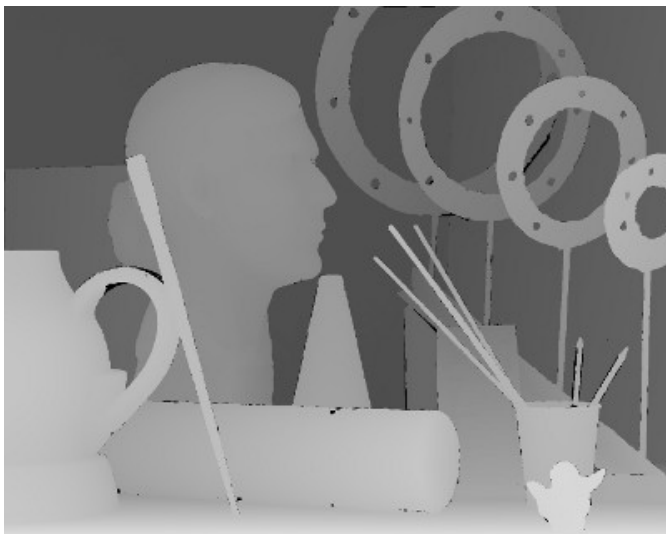
  - Potts

  $$V_{p,q}(f_p, f_q) = 50 * T(f_p \neq f_q)$$

  - Linear

  $$V_{p,q}(f_p, f_q) = min\{5 * |f_p - f_q|, 50\}$$

Results – Potts Vs Linear

Results- window size- 1,3,5 pixel

Thank You.