Disparity map computation by propagation of seeds

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Abstract. The goal of the practical work is to compute a disparity map from a pair of images using seed propagation. Disparity refers to the difference in pixel location between two images taken from different viewpoints. By finding correspondences between the two images, we can reconstruct depth information.

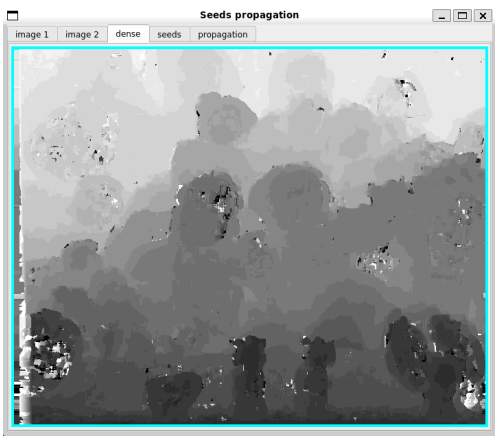
1. Methodology

Disparity maps were computed between image 1 and image 2 by finding the highest normalized cross-correlation (NCC) score for each pixel. Only disparities with NCC score above 0.95 were kept as initial seeds. These seeds were stored in a priority queue ordered by NCC score.

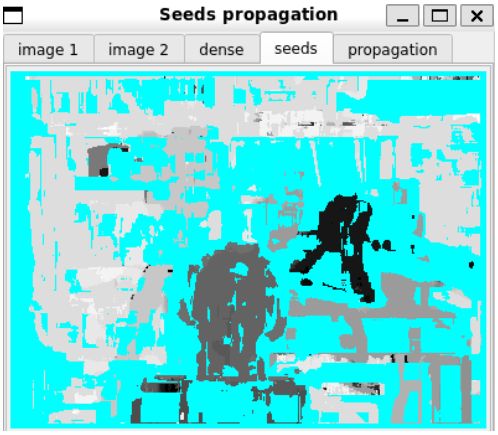
The disparity map was then grown from the initial seeds. For each seed point P, its 4-neighbor pixels Q were considered. If Q had no valid disparity assigned, its disparity dQ was computed as the highest NCC score among dP-1, dP, and dP+1. The neighbor Q was then pushed onto the priority queue. This process iterated until the queue was empty.

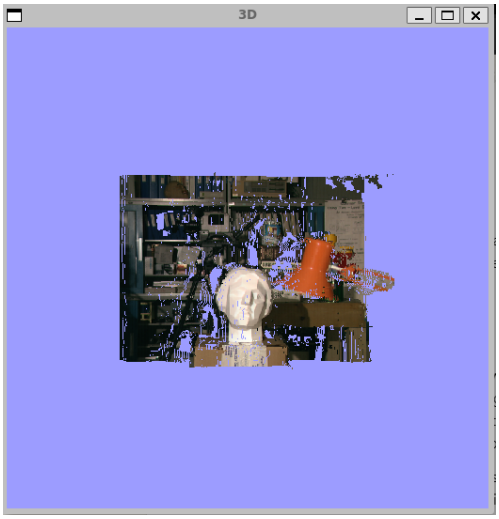
2. Results

T he disparity map obtained from seed propagation is shown in Figure. The map accurately captures the depth structure of the scene. Areas closer to the camera have higher disparity values (brighter) while farther areas have lower values. Some artifacts can be seen at object boundaries due to occlusion. Overall, the algorithm was effective at propagating disparities from the initial seeds.



(a) Image 1 (b) Image2





(a) Image 1

(b) Image2