

Multiview Image Completion with Space Structure Propagation

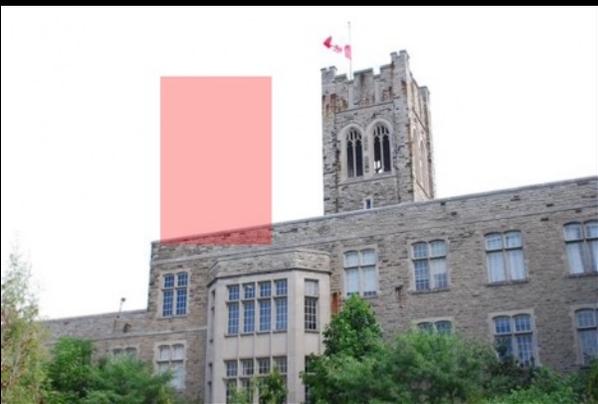
Supplementary Materials

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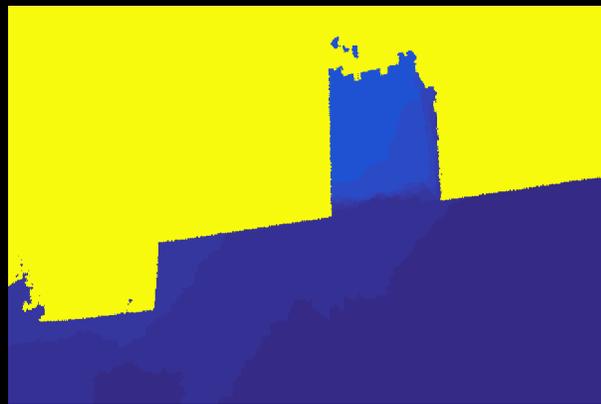
Korea Advanced Institute of Science and Technology (KAIST)

Comparison

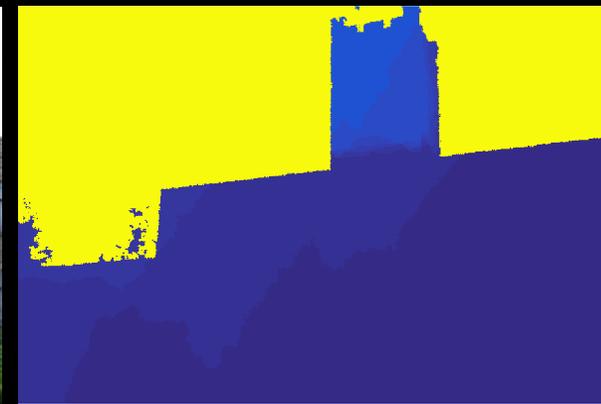
Multi-Image Completion



View #1 (original view)



View #4



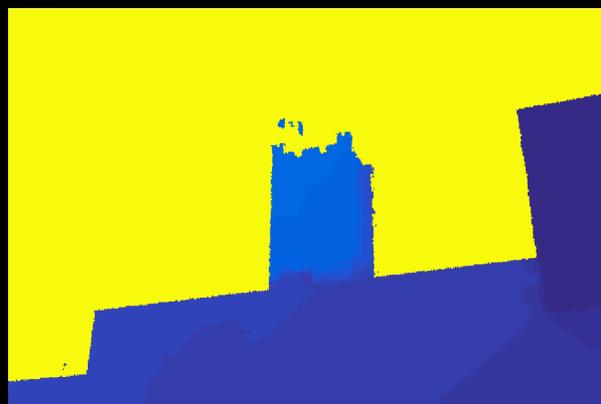
View #2



View #5



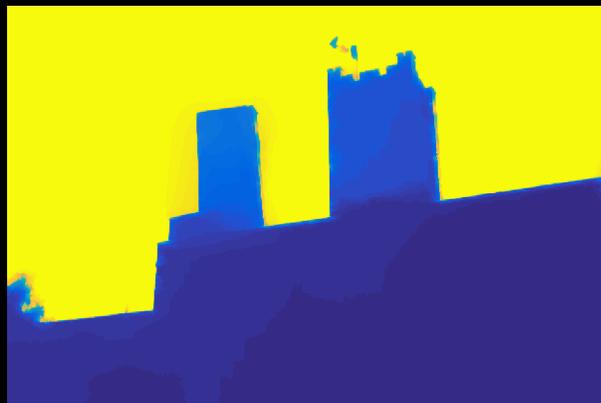
View #3



Input color images and depth maps



View #1 (original view)



View #4



View #2



View #5



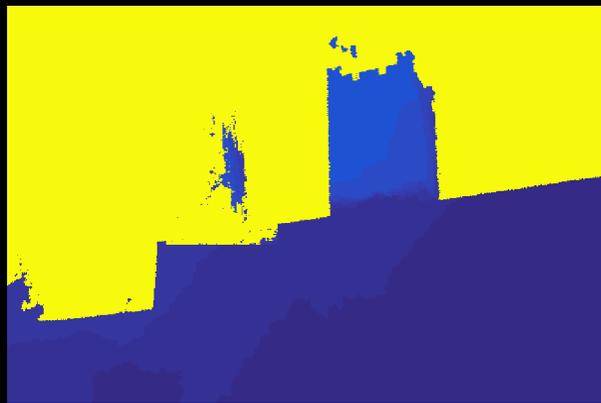
View #3



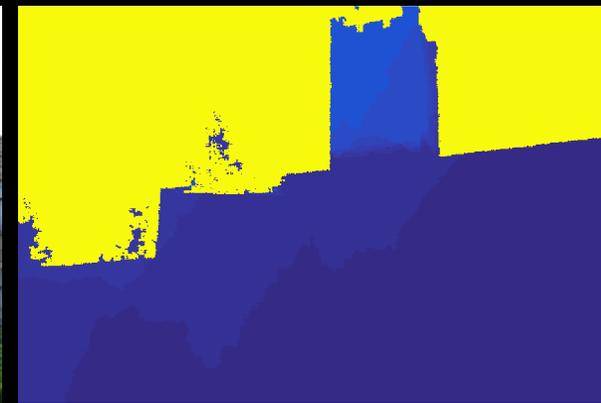
Our completion results



View #1 (original view)



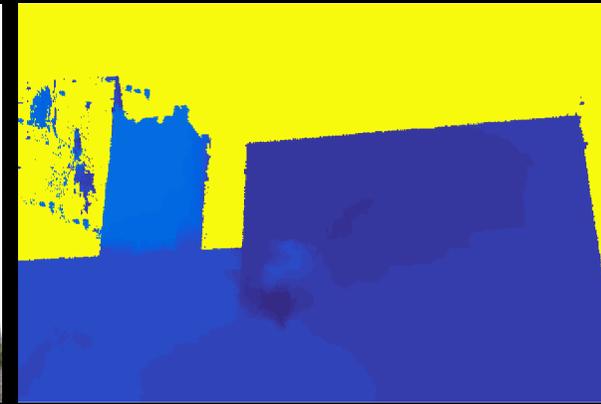
View #4



View #2



View #5

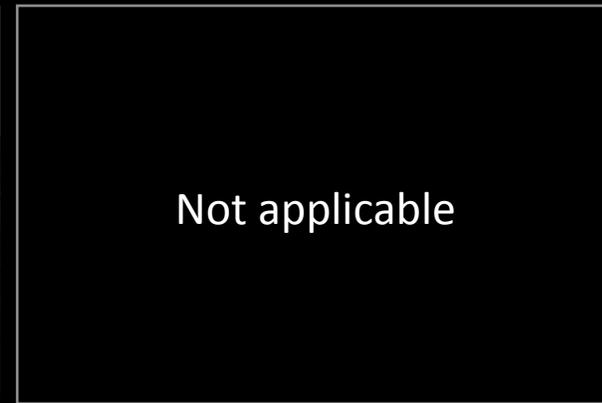
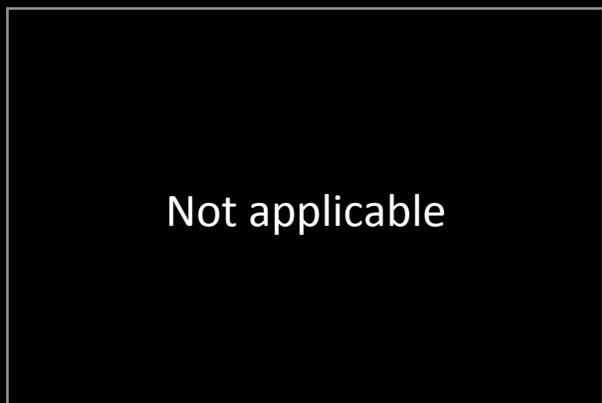


View #3



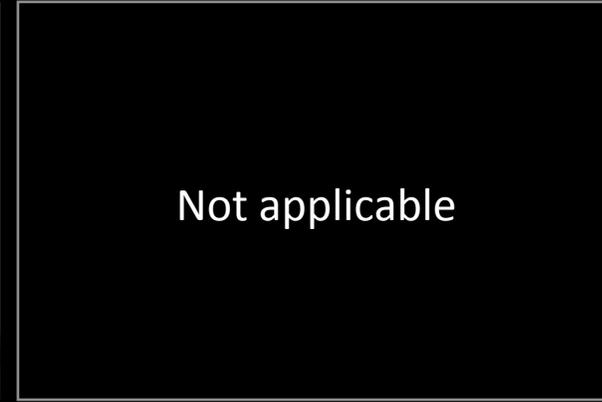
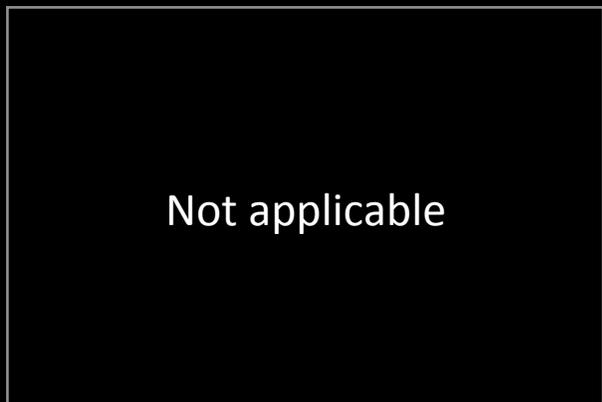
Wang et al. (stereoscopic completion)

Image courtesy of Olsson and Enqvist [1]



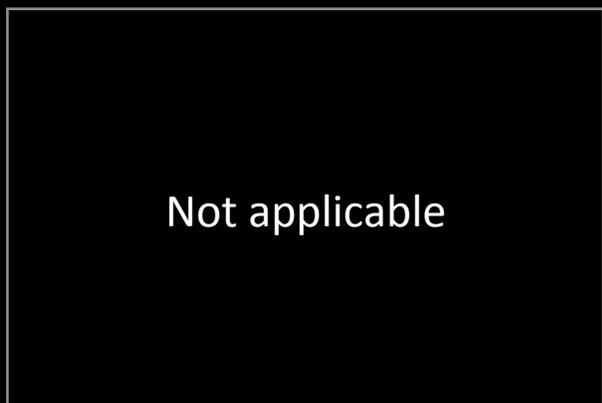
View #1 (original view)

View #4



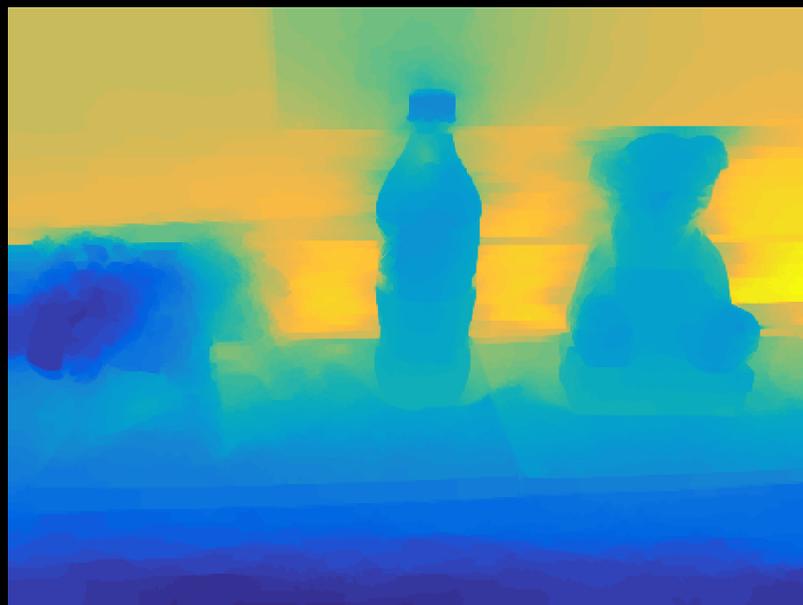
View #2

View #5



View #3

Photoshop (content-aware fill)

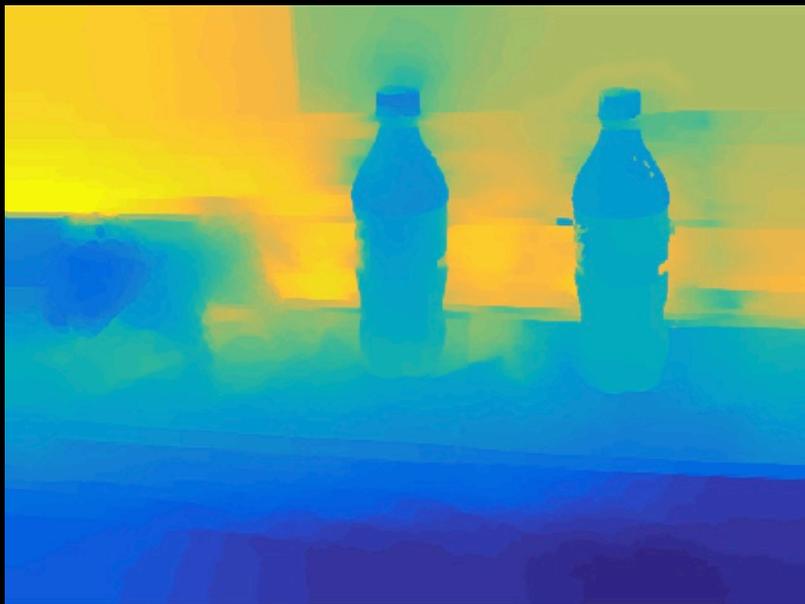


View #1 (original view)

View #2

View #3

Input color images and depth maps

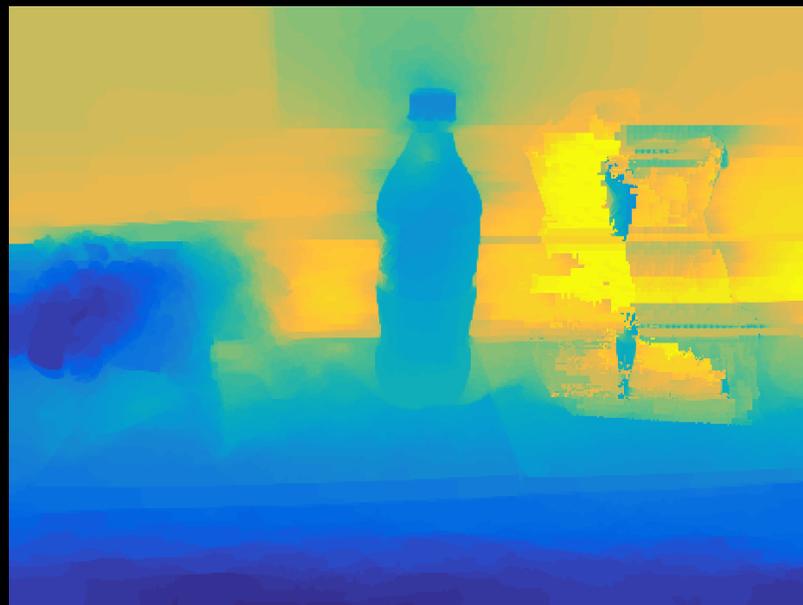


View #1 (original view)

View #2

View #3

Our completion results



View #1 (original view)

View #2

View #3

Wang et al. (stereoscopic completion)



Not applicable

View #1 (original view)



Not applicable

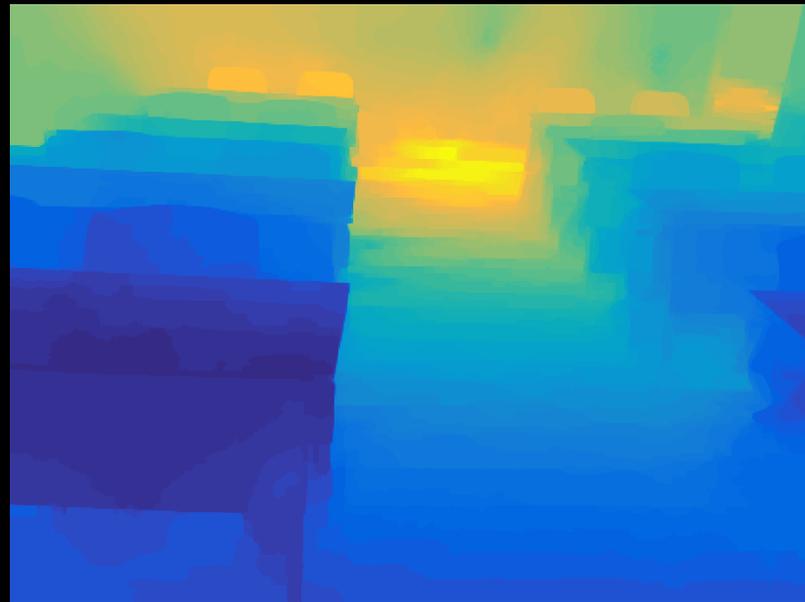
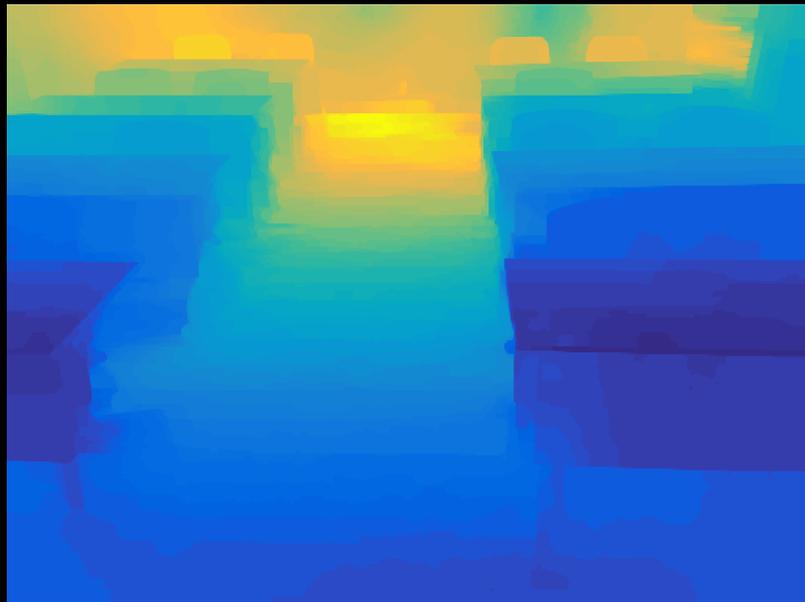
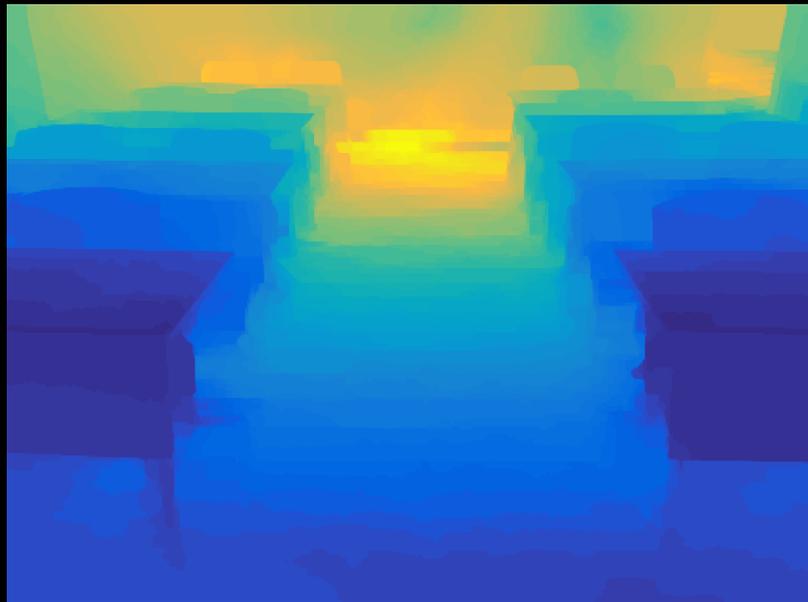
View #2



Not applicable

View #3

Photoshop (content-aware fill)

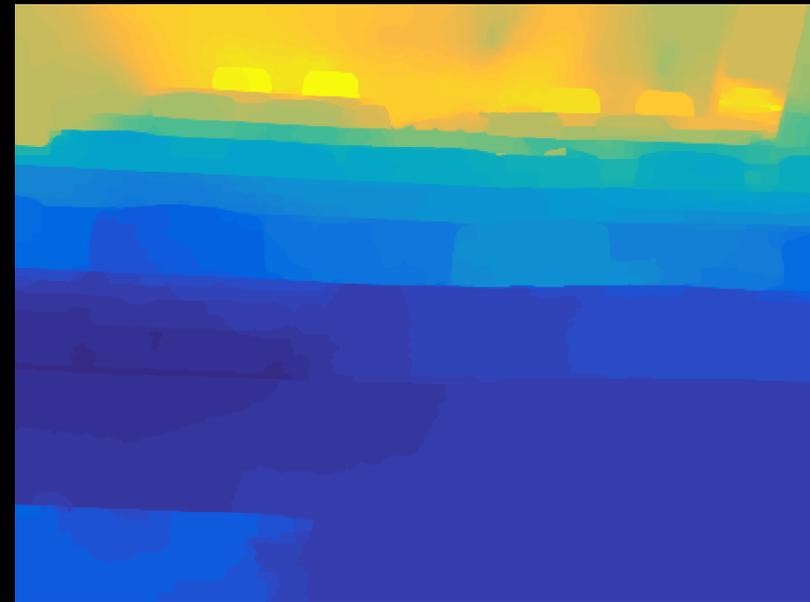
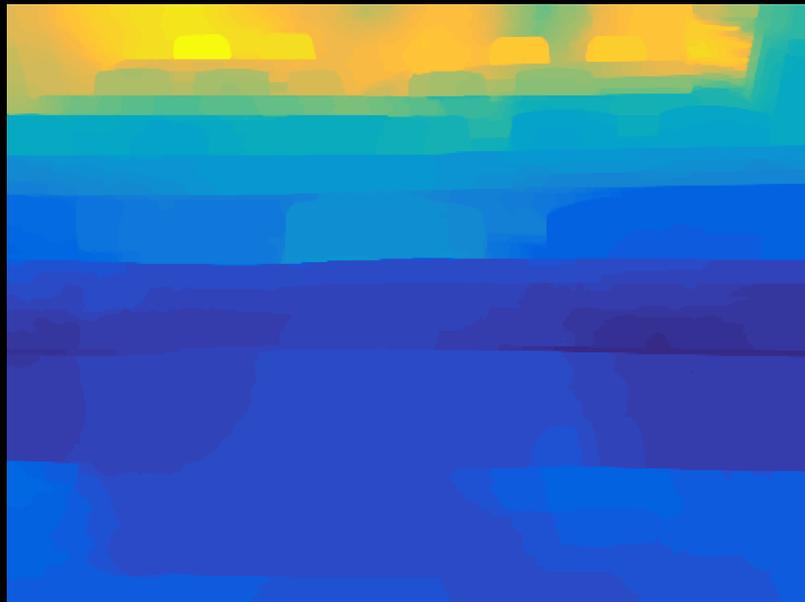
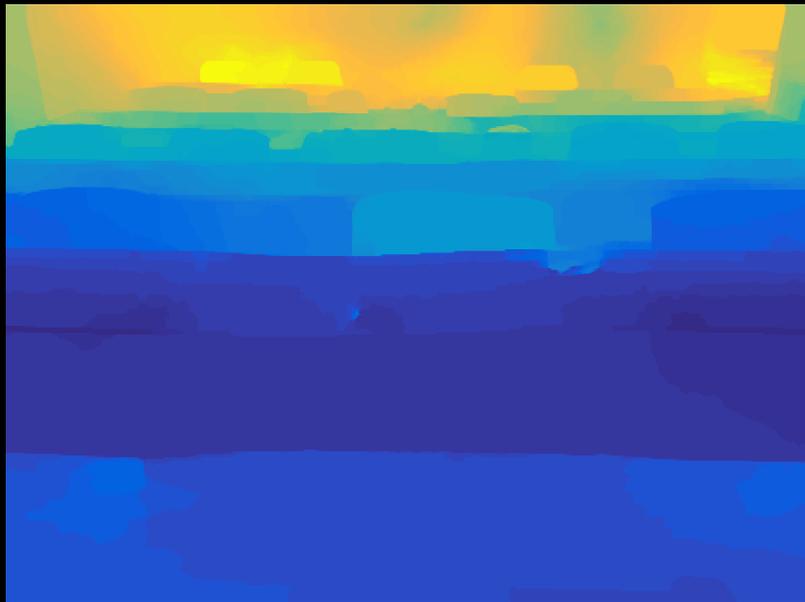


View #1 (original view)

View #2

View #3

Input color images and depth maps

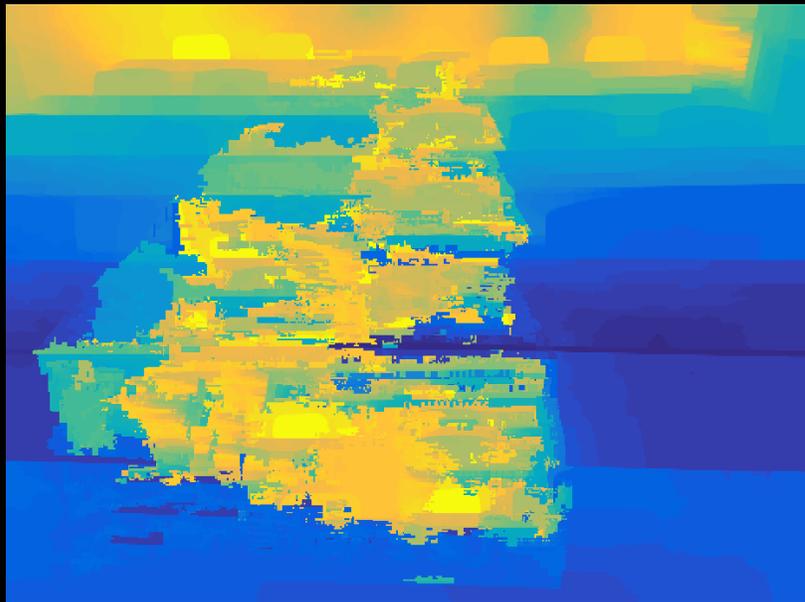
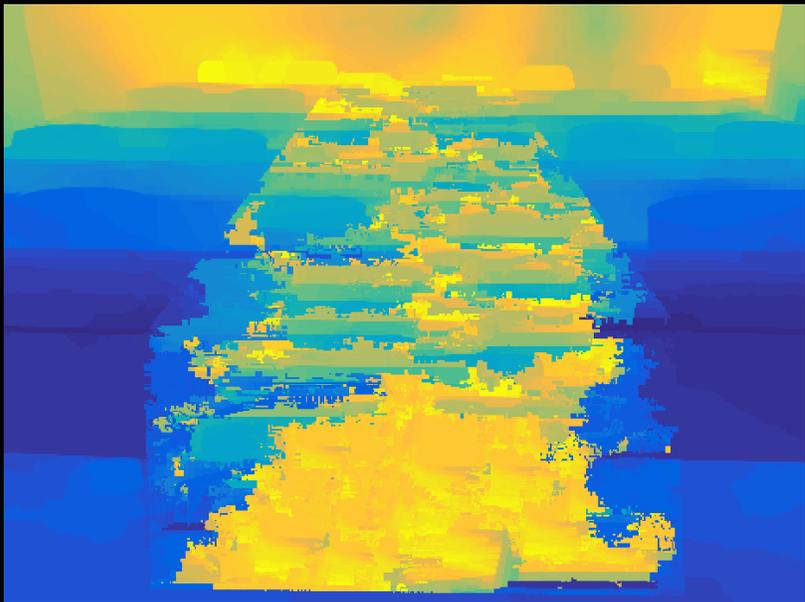


View #1 (original view)

View #2

View #3

Our completion results



View #1 (original view)

View #2

View #3

Wang et al. (stereoscopic completion)



Not applicable

View #1 (original view)



Not applicable

View #2

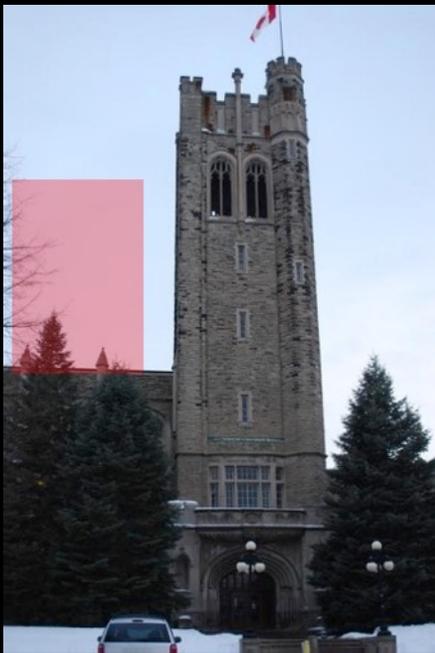


Not applicable

View #3

Photoshop (content-aware fill)

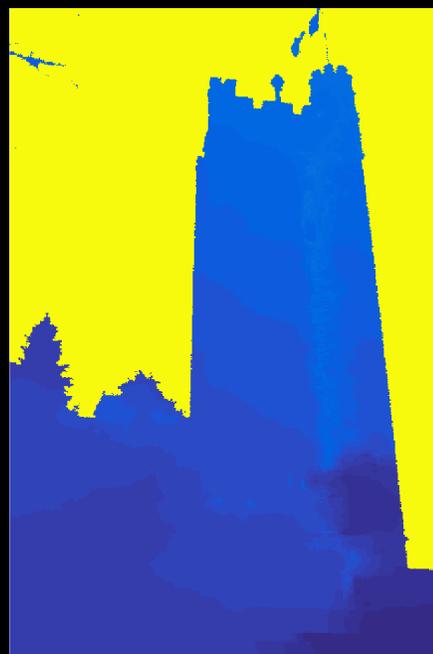
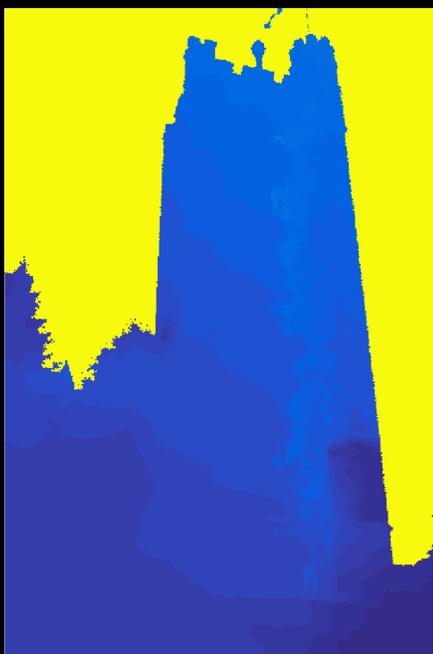
View #1
(original view)



View #2



View #3



Input color images and depth maps

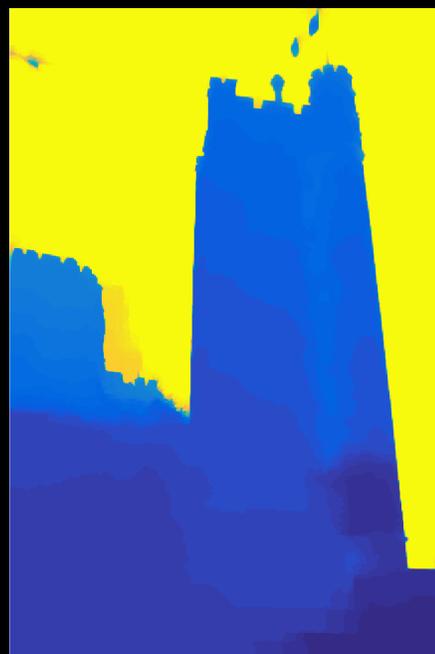
View #1
(original view)



View #2



View #3



Our completion results

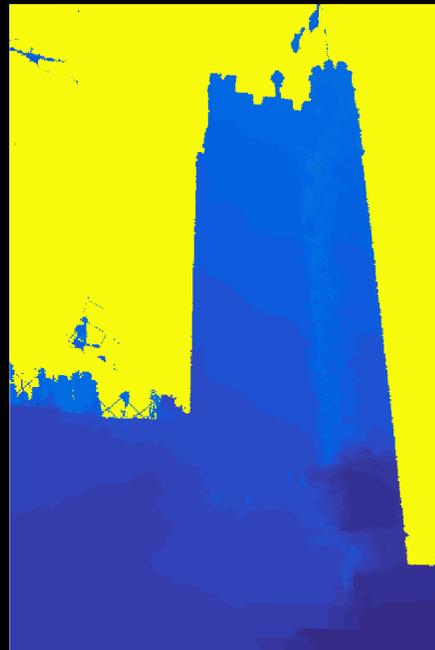
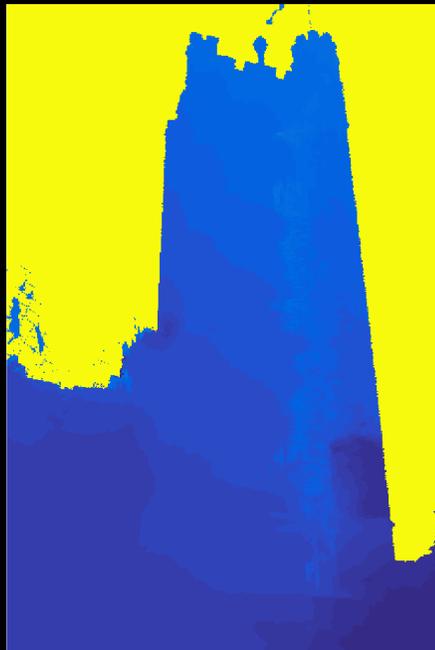
View #1
(original view)



View #2



View #3



Wang et al. (stereoscopic completion)

View #1
(original view)



View #2



View #3



Not applicable

Not applicable

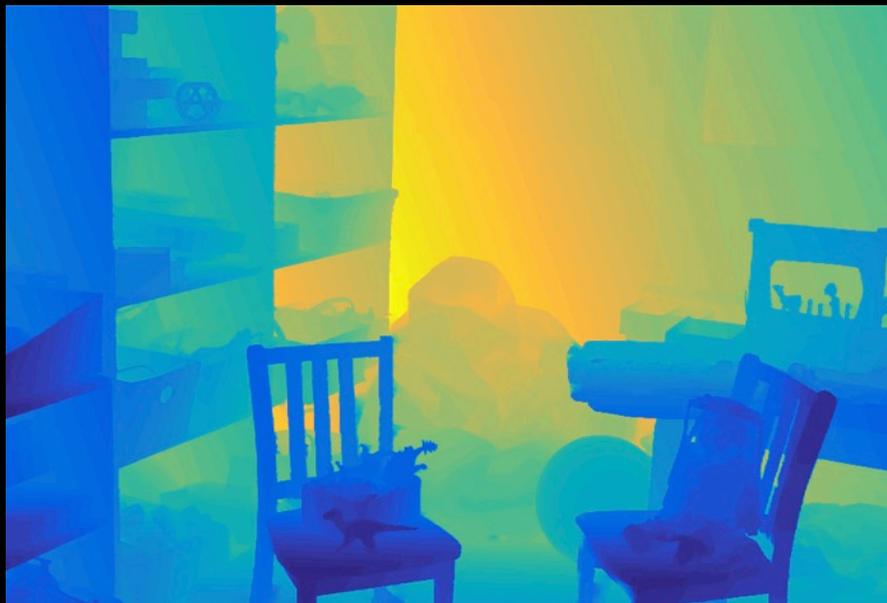
Not applicable

Photoshop (content-aware fill)

Image courtesy of Olsson and Enqvist [1]

Comparison

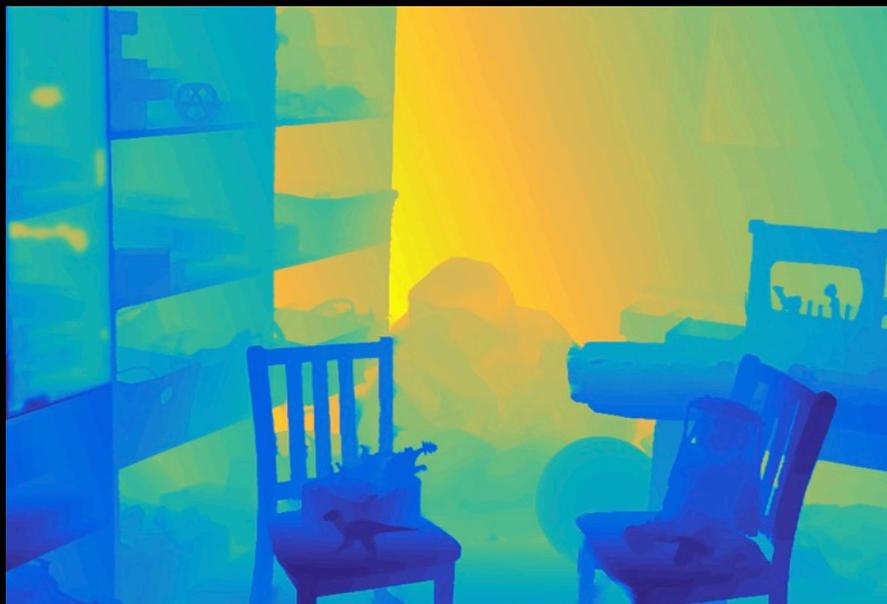
Stereo Image Completion



View #1 (original view)

View #2

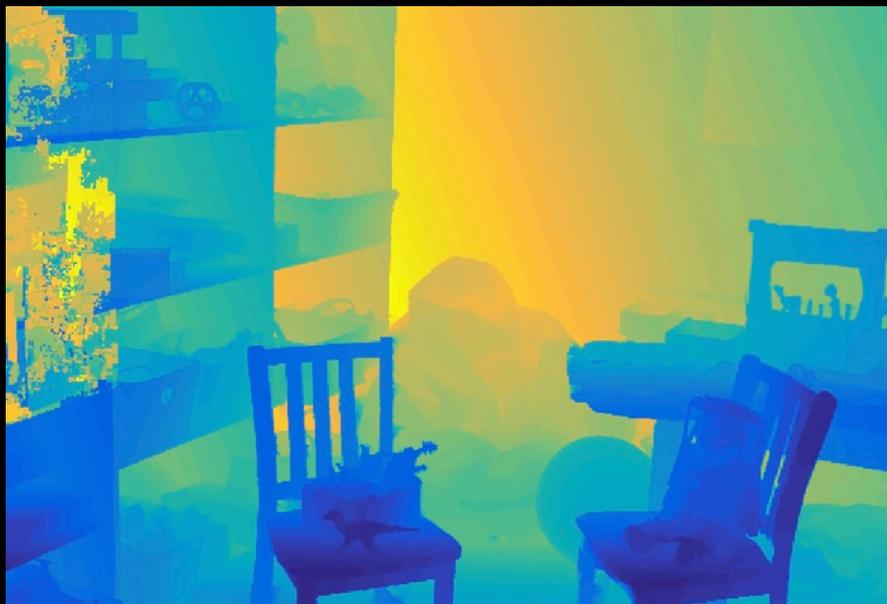
Input color images and depth maps



View #1 (original view)

View #2

Our completion results



View #1 (original view)

View #2

Wang et al. (stereoscopic completion)

Image courtesy of Scharstein et al. [2]



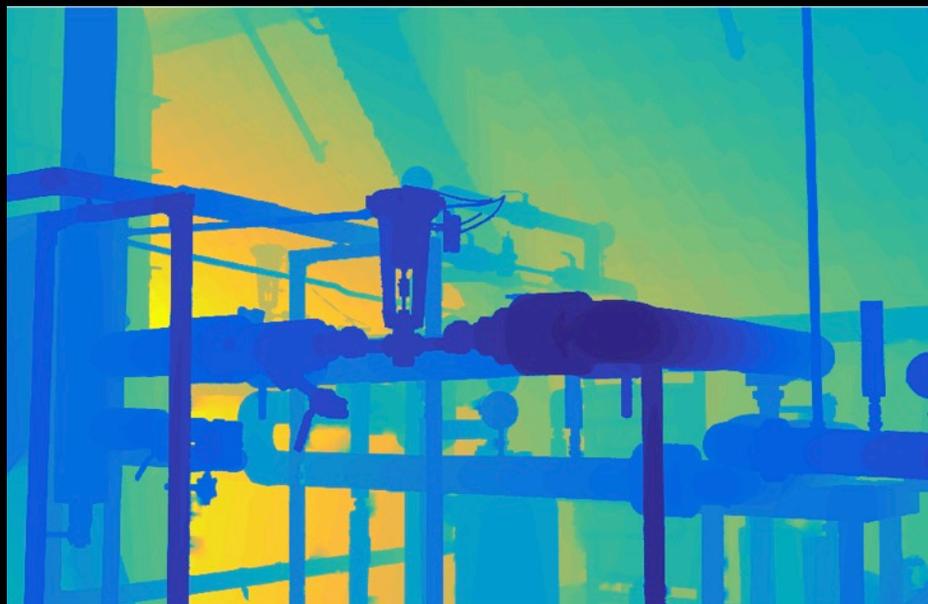
Not applicable

Not applicable

View #1 (original view)

View #2

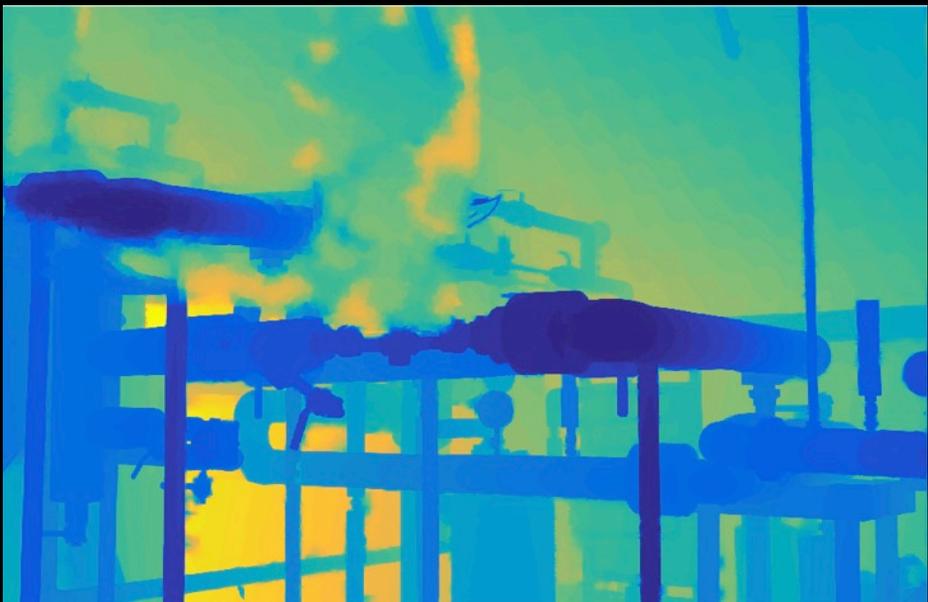
Photoshop (content-aware fill)



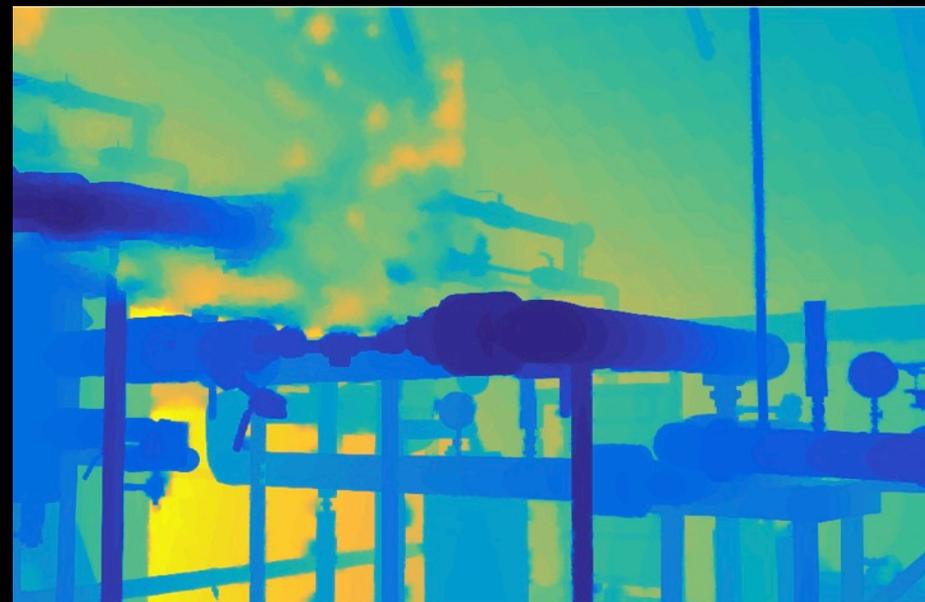
View #1 (original view)

View #2

Input color images and depth maps

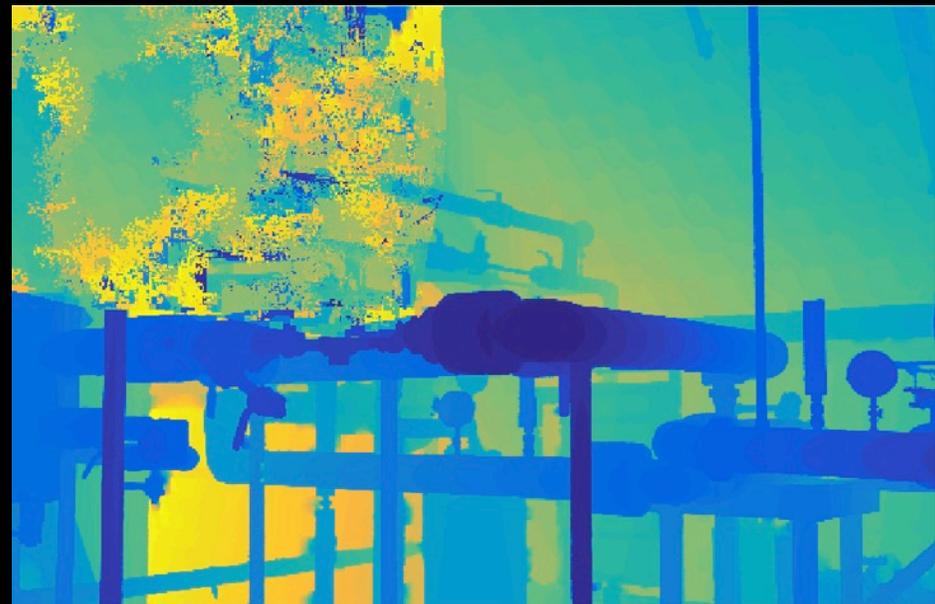
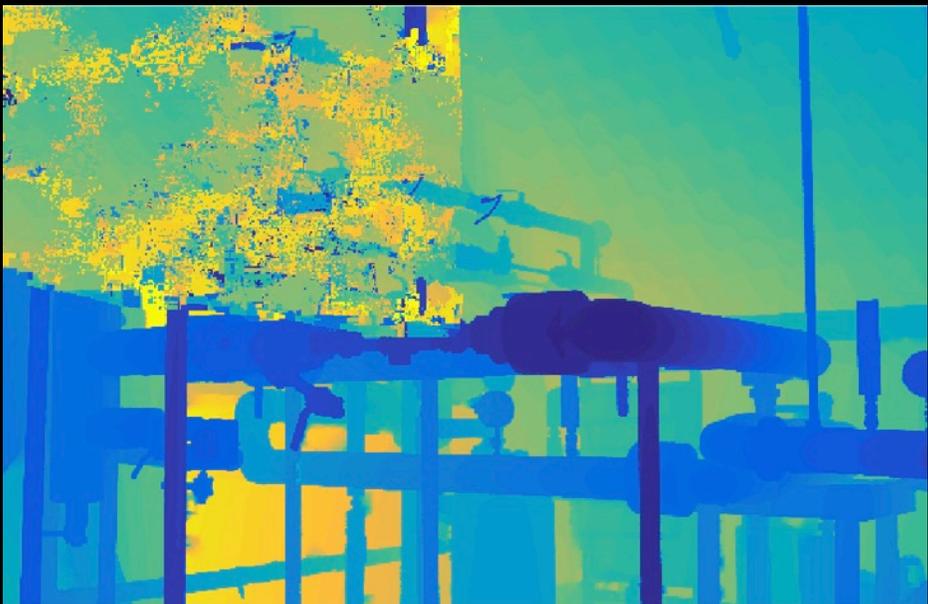


View #1 (original view)



View #2

Our completion results



View #1 (original view)

View #2

Wang et al. (stereoscopic completion)

Image courtesy of Scharstein et al. [2]



Not applicable

View #1 (original view)



Not applicable

View #2

Photoshop (content-aware fill)

Intermediate Results

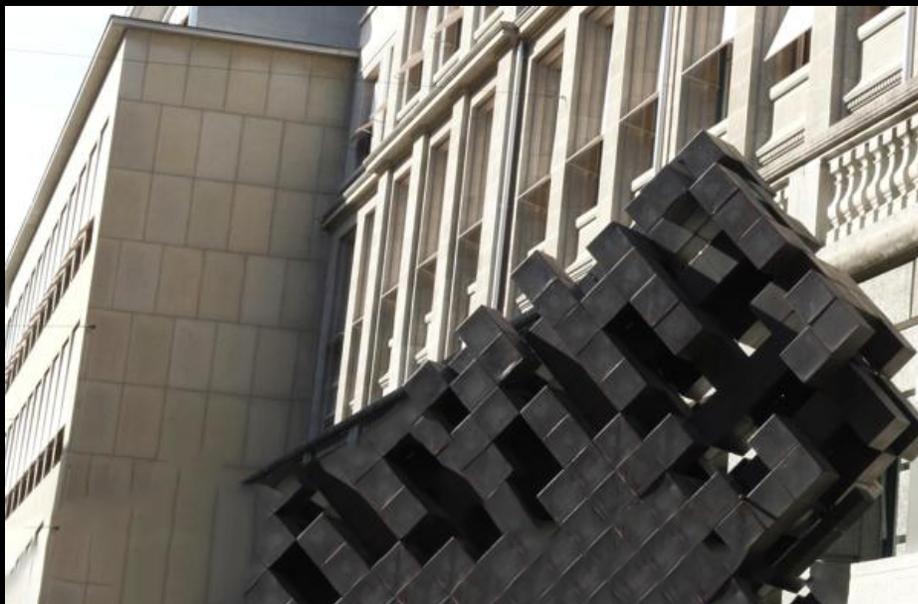
Our RGB-D Image Completion
(Single Image)



Input color image



Input depth map



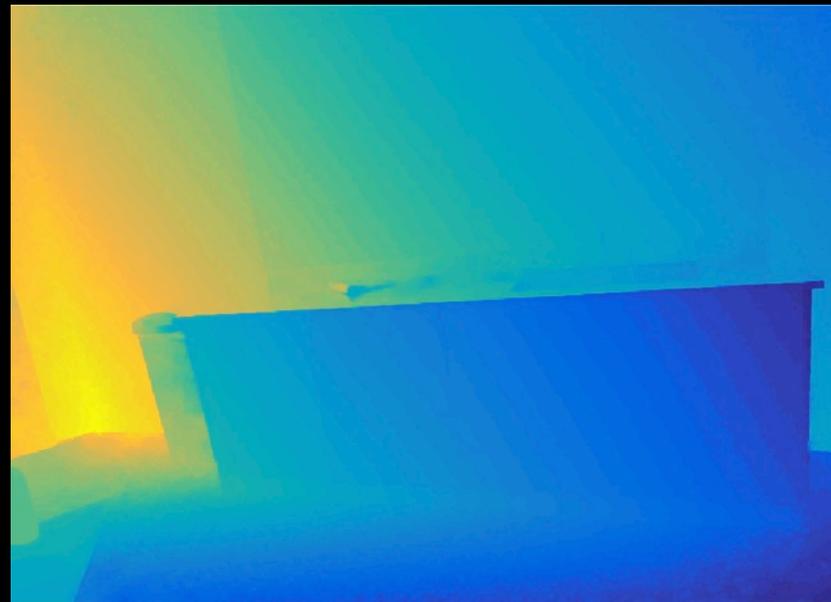
Completed color image



Completed depth map



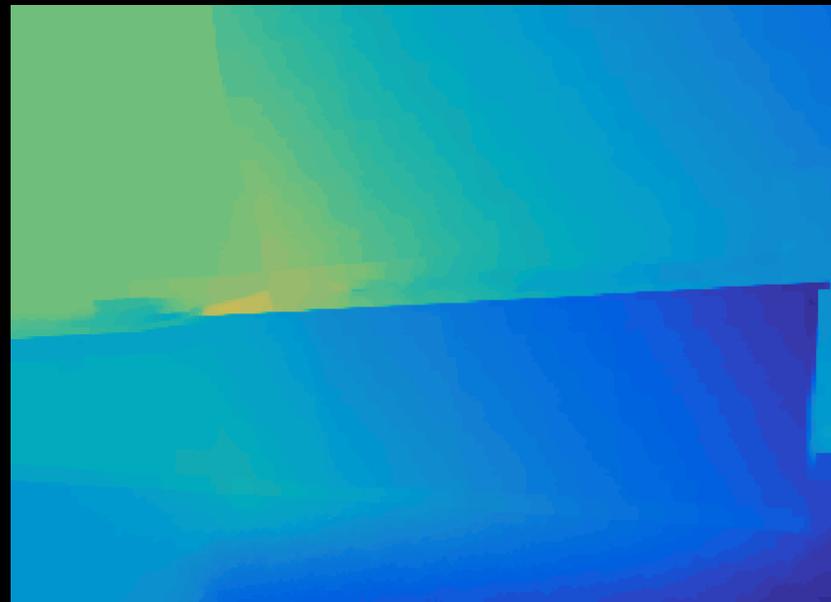
Input color image



Input depth map



Completed color image



Completed depth map

Intermediate Results

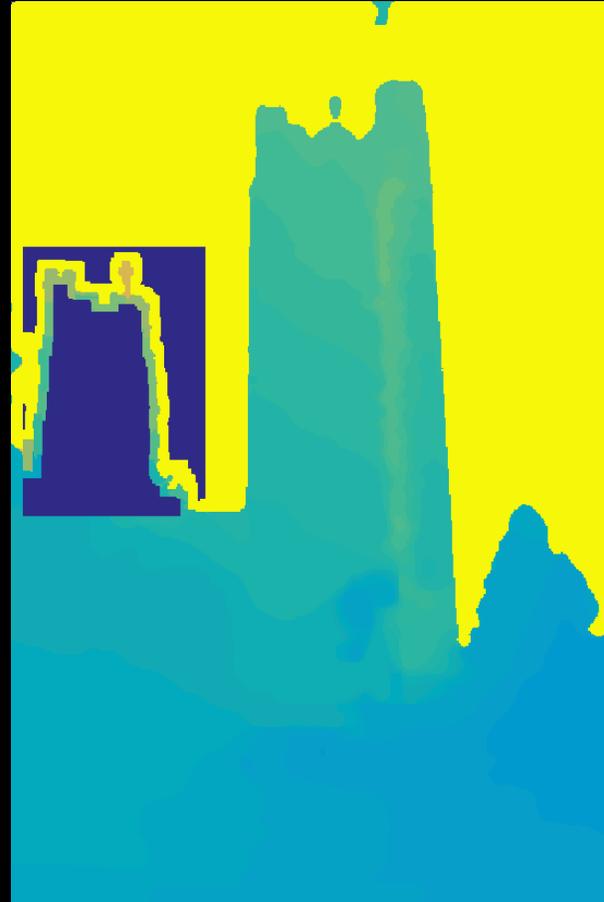
Our Depth Denoising



Completed color image



Reconstructed depth
w/o depth denoising



Valid depth samples after
superpixel filtering



Denoised depth

Intermediate Results

Structure Propagation



Input color images



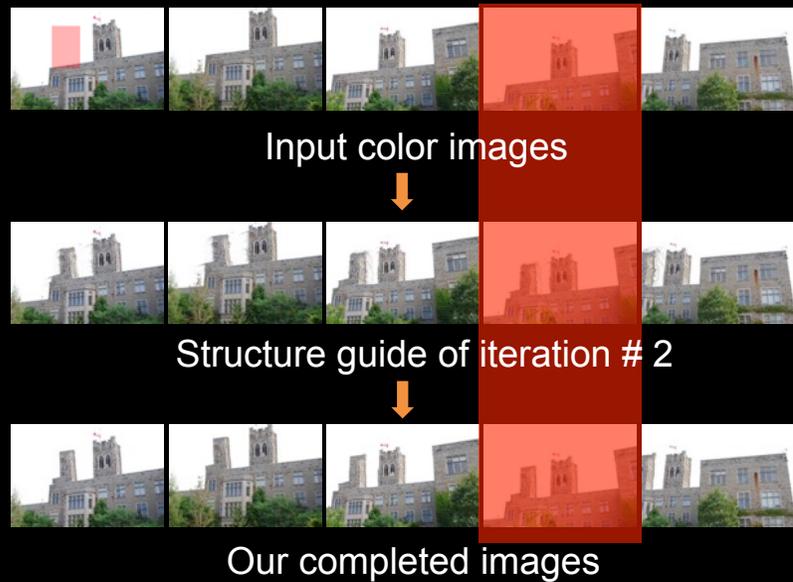
Intermediate structure guides



Image completion results

Parameter Evaluation

Structure Propagation
(parameters l_s and l_e)



Structure guide

We handle the errors of structure guide by controlling the parameters l_s and l_e in Equation (6).



$l_s = 0, l_e = 0$ ❌



$l_s = 1, l_e = 1$ ❌



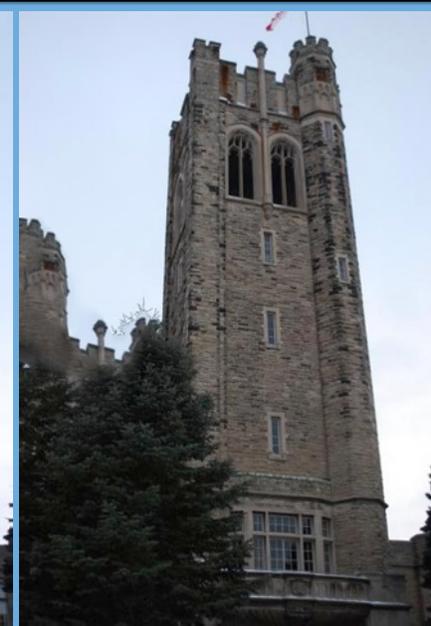
$l_s = 0.3, l_e = 0.6$ ⓪

Parameter Evaluation

Number of Iterations
(parameter N)



Input color images



1st iteration ($N=2$ in Algorithm 2)

2nd iteration ($N=2$ in Algorithm 2)

Parameter Evaluation

Number of Source Images
(parameter M)



Number of source images
(M in Section 4)

$M=1$

$M=2$

$M=3$

Image Sources

- [1] C. Olsson and O. Enqvist, ***Stable structure from motion for unordered image collections***, Image Analysis, 2011
- [2] D. Scharstein et al., ***High-resolution stereo datasets with subpixel-accurate ground truth***, Pattern Recognition, 2014
- [3] Kim et al., ***Scene reconstruction from high spatio-angular resolution light fields***, TOG, 2013
- [4] N. Silberman et al., ***Indoor segmentation and support inference from rgb-d images***, ECCV, 2012